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CONTENTS

THERAPEUTIC AND PREVENTIVE MEDICINE

TREATMENT OF WEAK LABOR PAINS. *By Stephen Rushmore, M.D.*, Boston.

ORIGINAL ARTICLES

A STUDY OF THE SYMPTOMS AND TREATMENT OF CONGENITAL TRANSDUODENAL BANDS. *By John Homans, M.D.*, Boston.

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THE WORK OF THE DISTRICT MEDICAL SOCIETIES.

THE NAVY AS A FIELD FOR MEDICAL WORK.

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For complete table of contents, see first text page.

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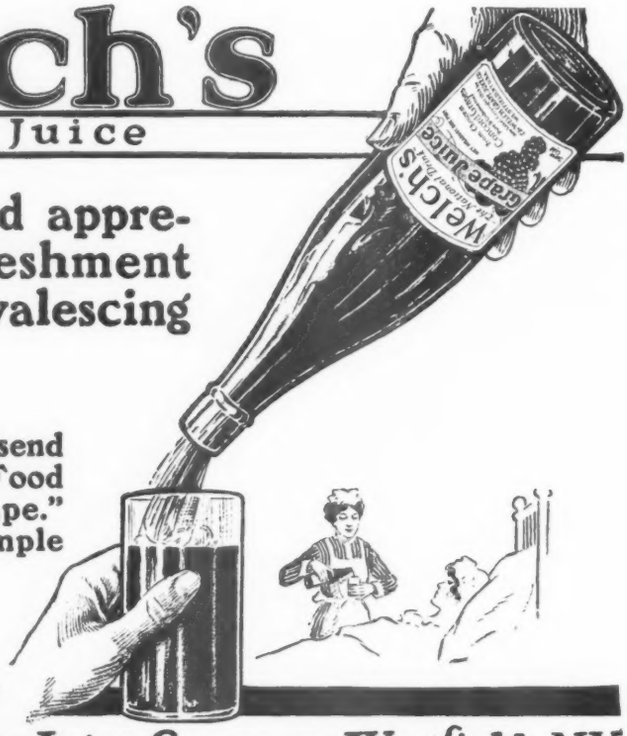

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TABLE OF CONTENTS

November 9, 1916

THERAPEUTIC AND PREVENTIVE MEDICINE

TREATMENT OF WEAK LABOR PAINS. *By Stephen Rushmore, M.D.*, Boston 659

ORIGINAL ARTICLES

A STUDY OF THE SYMPTOMS AND TREATMENT OF CONGENITAL TRANSDUODENAL BANDS. *By John Homans, M.D.*, Boston.. 665

INDICATIONS FOR WET PACKS IN PSYCHIATRIC CASES; AN ANALYSIS OF ONE THOUSAND PACKS GIVEN AT THE PSYCHOPATHIC HOSPITAL, BOSTON, MASSACHUSETTS. *By Herman M. Adler, M.D.*, Boston..... 673

JOHN CLARENCE CUTTER, M.D. *By Sarah H. Powers*..... 675

CLINICAL DEPARTMENT

SYPHILIS OF THE LUNGS. *By Nathaniel K. Wood, M.D.*, Boston 677

CONTROL OF SCARLET FEVER. *By D. M. Lewis, M.D.*, New Haven, Conn. 682

SOCIETY REPORT

BOSTON SURGICAL SOCIETY. MEETING OF APRIL 3, 1916..... 684

MASSACHUSETTS MEDICAL SOCIETY

DISCUSSION OF SYMPOSIUM ON GOITRE 685

REPORT OF COMMITTEE ON WORKMAN'S COMPENSATION 686

BOOK REVIEWS

A Practical Treatise on Infant Feeding. *By Harry Lowenburg, M.D.* 687

Painless Childbirth. *By Carl Henry Davis, M.D.*..... 687

A Guide to Gynecology in General Practice. *By Comyns Berkeley, M.D., and Victor Bonney, M.D.*..... 687

EDITORIALS

THE PROPAGANDA OF ANTI-VACCINATION..... 688

THE WORK OF DISTRICT MEDICAL SOCIETIES..... 688

THE NAVY AS A FIELD FOR MEDICAL WORK..... 689

THE CUTTER LECTURES..... 689

PROGRESS OF POLIOMYELITIS..... 690

MEDICAL NOTES 691

OBITUARY

DAVID FRANCIS LINCOLN, M.D. *By James J. Putnam*..... 693

CORRESPONDENCE

THE PROPAGANDA OF ANTI-VACCINATION. *Samuel B. Woodward, M.D.* 694

MISCELLANY

NOTICES, RECENT DEATHS, ETC..... 694

Therapeutic and Preventive Medicine.

TREATMENT OF WEAK LABOR PAINS.*

BY STEPHEN RUSHMORE, M.D., BOSTON.

THE subject of weak labor pains is one in which both the specialist and the general practitioner are interested. It is a timely one for consideration, I think, because of the present indiscriminate use of two means of assisting the unavailing efforts of the woman in labor to deliver herself of her child on schedule time. These are the extract of the pituitary gland and Cesarean section. In the past the obstetrical forceps has come in for its share of condemnation, but I think it has fallen somewhat into disuse now that the other methods have come into vogue.

Before discussing whether weak labor pains need any treatment, and, if treatment is indicated, when it should be instituted and how it should be carried out, it may not be out of place to recall some of the features of normal labor for purposes of comparison. Perhaps, by a consideration of the mechanism and physiology of normal labor, some light may be thrown on the pathological condition.

By the term "labor," we mean the effort of the female organism to separate from itself the products of conception. This effort, though largely involuntary in character, is not unconscious, but is accompanied by sensations of a disagreeable nature so acute and severe that they are called pains. So far as we know, labor is always painful among the higher mammals: the few exceptions are of interest as curiosities rather than as indicating a normal condition from which painful labor is a pathological deviation. To be sure the process seems to make greater demands on the individual in the higher forms, and among human females, the more highly civilized are more subject to difficulties of labor, of one sort or another.

Labor, terminating the period of gestation, comes on in the human female about two hundred and eighty days from the appearance of the last menstruation. But, if ovulation occurs about midway between the beginnings of two menstrual periods, as seems probable, conception takes place no less than two weeks from the beginning of the last menstruation, and gestation is more nearly two hundred and sixty-five days. But gestation is not always terminated on this two hundred and eightieth day, and while the well known rule for computing the date of confinement gives the day on which labor is most likely to begin, a week's variation in either direction is entirely normal.

When labor comes on, the uterus tries to expel its contents by contraction of the muscular fibres. These involuntary efforts recur at rather regular intervals, becoming stronger and more frequent. In time there are added voluntary contractions of the muscles of the abdominal wall and of the diaphragm, aiding in the expulsive effort. At first the contractions are manifest to the patient only as a drawing or tightening sensation, but later they are associated with pain, gradually becoming severe. During a painful contraction,

* Read at a meeting of the Penobscot County Medical Society, April 18, 1916.

the pain comes on at a distinct interval after the contraction has begun, and is due to pressure of the presenting part and stretching of the cervical canal and the vagina as well as to the spasm of the muscle. For a long time three stages of labor have been recognized: (1) the stage of dilatation of the cervical canal until it is large enough to permit the passage of the fetus from the uterus; (2) the stage of expulsion, during which the fetus is expelled from the uterus and the vagina is dilated; it is terminated by the birth of the child; and (3) from the birth of the child to the expulsion of the placenta.

Of the nervous mechanism we know little except in a general way. The uterus is abundantly supplied with nerves and ganglia and can carry on its usual function separated from the central and sympathetic nervous systems, as is shown by experiments on the isolated pregnant uterus of animals. Clinical observations have shown that complete transverse section of the spinal cord does not interfere with labor except in so far as it prevents the contraction of the abdominal muscles. That psychic influences may play a part is well known, but in general the central nervous system has only a regulating function. There may be, and probably are, several centres in the cord from which reflex impulses may inhibit or accelerate labor, but of them we actually know very little.

Experience has shown that the computed date for confinement, two hundred and eighty days after the appearance of the last menstruation, is about the best time for the infant to be born. If it is born much before this date, it is underdeveloped and not likely to live. If born much after this date, not only is the child larger and thus likely to cause more difficulty during birth, but for reasons of which we know nothing its vitality is often found to be reduced, even if birth has been normal and easy. How does the maternal organism know when to fall into labor, and how does it know what is the best time for the child to be born?

Explanations of the cause of labor are numerous and date back to antiquity. Some of them are fanciful and need only to be stated to show their error. Others are more reasonable, but must await further investigation for a final judgment as to their validity. In certain cases of labor before term, we find disease of the placenta, or of the decidua, overdistention of the uterus, or trauma, which may have been the cause of the incidence of labor in that particular case, but in normal labor at term no such factors are present. We might make an exhaustive study of the ways in which labor can be induced, and comparing the changes which occur with the changes in normal labor might find a suggestion as to the usual cause. But this has not yet been done.

One constant fact we have as a basis. There is in pregnancy a growing irritability of the uterus, and with it an increase in frequency and strength of the intermittent contractions known as pregnancy contractions. But of the cause of this we know nothing. Another characteristic of the pregnant uterus is that if strong contractions are started from any cause, they tend to continue until labor is ended. At the present time, when we are finding the long-looked-for explanation of so many phenomena of living organisms by the help of the finer chemistry, it is natural that the suggestion should be made that some substance circulating in the maternal blood should be the cause of labor pains, and experimental investigations bear this out, though only a beginning of study along these lines has been made. In the first place, experiments have shown that the connections with the central and sympathetic nervous systems are not necessary for labor. These and other experiments indicate that the cause of labor is a substance in the maternal circulation acting on the uterine muscle or on the intrinsic nerves of the uterus.

What is this substance and from what organ or structure does it come? Its nature is wholly unknown to us but its point of origin can be tested in a general way by injecting into animals, near term, extracts or blood from various sources. It has been found that injections of from twenty to fifty cubic centimeters of fetal blood into the vein of a pregnant woman at, or near term, will bring on labor in a few hours. The conclusion has been drawn that labor is due to a substance produced by fetal metabolism, accumulating in the uterus and giving rise to gradually increasing irritability.

While there is no reason, I think, for doubting the experimental facts, the conclusion may be open to certain objection. These experiments, and others which I will not take the time to describe, have established simply the facts that the substance or group of substances which produces labor is found in the fetal and in the maternal circulation. But as an interchange of substances between the two circulations is possible, the primary source of the stimulus is not clear.

The duration of labor depends on a number of factors which may be grouped under the following heads:

1. The force exerted by the uterus and by the abdominal muscles in dilatation and expulsion.

2. The application of this force, whether mechanically advantageous or disadvantageous. The vertex presentation with head well flexed and membranes unruptured gives an application of the force during dilatation of the cervix which is very advantageous. Malpositions of the fetus with ruptured membranes may give a very disadvantageous application.

3. The resistance of the maternal parts, which has to be overcome.

4. The size of the fetus.

The test of normal labor is that the woman should pass through this process without injury

to herself, and deliver herself of a normal child in approximately the same time as other women. It is a test which we can apply easily when labor is over, and which we can apply in a general way during labor, but we are quite at a loss before pains have started. While we can measure the pelvis and determine the position of the child, guess at its size and estimate the resistance of the soft parts, we have little accurate knowledge of these points and we can only be in doubt and ignorance when it comes to judgment as to that most important factor,—the strength of the uterus.

Efforts have been made to study the pains of labor with some exactness, measuring their force and duration and noting their character. The classic tokodynamometer of Schatz, a compressible bag introduced into the uterus and connected by a tube with a column of mercury, has proved very useful in spite of its limitations. But it is applicable only in special studies and is not suitable for routine procedures. Recently Fabre has described what he calls external hysterography, a method of automatically recording the contractions of the uterus during the course of pregnancy, labor and the puerperium. The apparatus is applied to the abdomen and the record is made by means of levers, a drum and revolving cylinders. It may be employed at any stage of labor and is not disturbed by respiration or by the fetal movements.

By this apparatus Fabre was able to get a better idea of the character and strength of labor pains than by palpation, timing the pains and noting the subjective symptoms of the patient. He was able to observe also the effect of drugs on the uterine contractions. He claims that the administration of chloral hydrate, ether and morphia, controlled by hysterography, will give marked diminution of the pain of labor, without interference with the muscular activity and without endangering the life of the fetus.

If a patient is in labor, how can the process be modified, either by increasing or diminishing the pains? Here the same factors by which labor may be induced come into consideration, but I shall only mention at this point some of the results of Fabre's studies of drugs in checking uterine contractions. Chloroform and ether cause a slight diminution in the force of the pains; chloral hydrate makes them more regular as well as diminishes the frequency. Morphia seems to diminish the intensity of the abnormally strong pains while scopolamin seems to cause a cessation of activity. These results have not yet been confirmed by other investigators using his method, but the method would seem to offer possibilities of considerable advance in the accuracy of our knowledge.

What do we mean by the expression, "weak labor pains"? The term is relative, for in the course of normal labor the pains are, at times, of little force and yet are perfectly normal, as, for example, early in the first stage and in the third stage. Sometimes, too, in the first or second stage, the pains may show a marked remission in force, but they begin again with renewed vigor and continue until labor is terminated within the normal period of time. So that by weak labor pains we mean lack of force over a prolonged period or at a time when we should expect the pains to be forceful. They may occur in the first, second or third stage, and as uterine contractions continue after the expulsion of the placenta; a complete study would cover this period also, for post partum complications may develop as a result of weak uterine contraction.

Weak labor pains may be either primary or secondary. By primary, we mean those in which either the normal stimulus to contraction is weak, or the muscle itself does not react well. Of the normal stimulus to contraction we know very little, but if it is a substance from the fetus accumulating in the uterine wall and sensitizing the uterus, we can see how insufficient sensitizing might be a factor, at term or particularly before term. While this would explain certain cases of defective uterine contraction, there is little more than theory for a basis.

Of defective muscular development, a little more is known. Patients with delayed uterine development, or those who have passed beyond the highest development and are approaching the senium, or those who show developmental malformations, more frequently show anomalies of uterine contraction, which are perhaps due to defective development of muscle. Defective innervation may also play a part. It is my impression that the increasing difficulty which the modern civilized woman has with labor is due to defective hygiene during the period of adolescence, which has its effect not only on the nervous system, making women less capable of standing the strain of pregnancy and childbirth, but through underdevelopment of the genital system actually increasing the strain.

Primary weak pains are not at all infrequent and may be due not only to the causes mentioned, but to any factor affecting the general condition of the patient, as prolonged ill health from any cause, as well as to local disease which has reduced the strength of uterine muscle, once well developed.

By secondary weak pains we mean those which are weak having once been strong. This condition comes on because the muscle is tired from overwork. Here again we have a relative term, for what might be entirely adequate force under certain conditions is not enough if there is slight obstruction, or difficulty of delivery due to occiput posterior or breech, or slight disproportion between head and pelvis, or rigidity of the soft parts.

Now if we have a patient in whom the pains of labor are weak, according to our definition, that is, over a prolonged period or at a time when they ought to be strong, why should we do anything? Will not nature prove adequate

and will not the woman deliver herself in the course of time? The mere asking of this question brings clearly to the minds of all of us the sad memory of times when nature did not prove adequate and when in spite of such assistance as we could render, the mother as well as the child suffered greatly. But it does not give the answer as to when assistance is indicated, nor the kind of assistance that may be most appropriately rendered. These are determined by the stage of labor, the condition of the mother and the child and by the resources which we have at our disposal. I am taking it for granted that thorough examination has excluded as far as may be the presence of any gross anomaly of fetus or pelvis.

A consideration of the resources at our disposal will show what they can and cannot accomplish and thus the indications for their use. Among the resources are, briefly, rest, massage of the uterus, changes in position in bed and by walking, rupture of the membranes, dilatation of the cervix and the administration of drugs. Sometimes in normal labor we see the pains die down and, after an interval of apparent rest, start up again with renewed vigor and go on to the termination of labor. In certain cases after the onset of labor, when the pains are weak or have disappeared, the patient will rest or even sleep following the administration of chloral hydrate, morphia, or scopolamin and morphia, and on waking will complete labor with normal pains. This happy outcome may be expected only when the mother and fetus are in good condition and the inertia is manifest in the first stage of labor, when alone this treatment is justifiable.

Since certain mechanical stimuli increase the rate and force of uterine contractions, massage of the fundus is a rational method of treatment, but experience has shown that it does not accomplish what we want, producing only a single contraction while the stimulus is applied. The same may be said of changes of position in bed, turning the patient from side to side or from back to side. It may produce a few contractions, but that is all.

In the first stage we have all found that having the patient walk around the room is a useful and sometimes a perfectly adequate stimulus.

Occasionally early rupture of the membranes will give increased activity of the uterine contractions, but how it acts is not clear, and in general it does not accomplish much, and if the bag of waters is opened too soon the patient loses the benefit of the hydrostatic wedge in the dilatation of the cervix.

But what we want is a more certain method of inducing labor pains or stimulation to adequate activity if they are present but weak. This is found in forcible dilatation of the cervix. It is perhaps a part of the mechanism of normal labor, the increasing dilatation from pressure of the presenting part producing increased uterine contractions. Two methods have been suggested in practice,—manual dilatation and dilatation with a bag, various forms of which have been employed by different operators. In either case an instrument may have to be used to start the dilatation, until the fingers can be introduced or until the bag can be placed in the cervix, but it is not always necessary.

Manual dilatation requires surgical anesthesia and is rapid and, therefore, more likely to give troublesome lacerations of the cervix. There is a certain increased risk from infection. It should be given up in favor of the bag except when rapid dilatation and immediate delivery are necessary. Here for primigravidae I personally prefer to replace it by another procedure of which I shall speak presently.

The type of bag which is perhaps most frequently used in this country is that suggested by Voorhees of New York. It is cone shaped with a tube attached to the apex of the cone, and is made in several sizes. It is made of linen or cotton fabric, covered on both sides with rubber, and is, therefore, watertight as well as inelastic. It is introduced in a collapsed condition, without an anesthetic, under primary ether, or preferably, under nitrous oxide or nitrous oxide and oxygen anesthesia, and filled with sterile water. The tube is then tied or clamped and the patient left alone. If labor does not come on promptly, or if there is reason for hastening labor, traction on the bag may be made by a weight hung over the foot of the bed. It is a most efficacious instrument and I know of only one objection to its use, namely, the possibility of introducing infection. But it would seem that careful technic would almost eliminate this danger, and I have never seen a case of infection following its use.

I have referred to those cases in which with weak uterine contractions and undilated cervix, immediate delivery becomes necessary in the interest of the mother or of the child. The possibilities are rapid dilatation of the cervix and extraction of the child by forceps or after version, and Cesarean section. The discussion of the indications for either procedure is outside of my province this evening, but I would simply call your attention to the advantages of the so-called vaginal Cesarean section, which is not a Cesarean section at all, over manual dilatation of the cervix.

The operation is to incise the cervix in the median line anteriorly and posteriorly, if necessary on both sides also, until an opening is obtained large enough to permit extraction of the child. The irregular lacerations following manual dilatation, extending an uncertain distance, are replaced by incisions made by a sharp instrument, and therefore, with less trauma, under constant supervision. Suturing after extraction is more easily accomplished. If necessary, incisions of the perineum are made and easily closed.

The last resource which I shall consider, and it is the last in the order of consideration and not in the order of use, is drugs. Among drugs which have been used to stimulate uterine contractions there might be mentioned many which have been tried, but were soon rejected. Recently there have been subjected to the test of practice salicylic acid, sodium borate, cannabis indica, strychnia, cola, cane sugar, milk sugar, digitalis and caffein.

Certain oils have been recommended as emmenogogues and it is known that they will produce abortion; for example, oil of rue, of thyme, of turpentine, apiol, and sabine. The suggestion was made that under proper control they might be useful in stimulating normal uterine contractions. Careful tests of their action on the isolated uterine muscle of pregnant and nonpregnant animals have been made. It was found that they have a paralyzing action even when very dilute, so that they are to be regarded not only as of no value, but as positively dangerous in practice.

Noteworthy among the substances which have been given up after trial is pilocarpin which has a distinct oxytocic effect as shown by clinical experience as well as by laboratory experiments. Its use was begun about forty years ago and it was administered hypodermically during the period of dilatation. Troublesome symptoms, however, as salivation, possible unfavorable action on a weak heart and occasional tetanus of the uterus led to its disuse.

Quinine also had a vogue and was warmly recommended. Then followed a period of neglect and a recent period of revival of its use. Experimentally its effect in toning up the uterus is evident. But while it has this use clinically also, and is quite safe for the mother and child, its effect is inconstant, may not appear at all, may appear late or may be very slight. It is most effective in the period of dilatation. Very recently it has been used after pituitrin in cases in which the desired effect did not appear, and it has given gratifying results.

In considering ergot and its preparations and derivatives, we come at once to a field of active controversy. It is not because of any doubt as to the intensifying effect of ergot on the uterine contractions. This was known to Hippocrates. The drug is mentioned in the early Chinese literature and in the Middle Ages was much used as an abortifacient. Its use was known to be associated with danger and there occurred isolated cases of poisoning as well as epidemics of ergotism, the so-called sacred fire.

For over a century efforts have been made to obtain from the crude drugs the active principle in a pure state, and the effort, continued to the present time with the resources of modern chemistry, has not been crowned with unqualified success. Various substances have been isolated, one of which produces effects closely resembling the typical effects of ergot; the second is much like adrenalin, and a third is like preparations of the pituitary gland. Still other substances have been obtained by other investigators. While this is very interesting from the theoretical point of view it has not much practical bearing, though very recently preparations have been produced which at first sight seem promising. As yet there has not been opportunity for their thorough trial.

The old question of when to use ergot, closed as some of us thought, has been opened again by Kehrer who found that in a series of closely watched cases, ergot at the end of the stage of dilatation had no tendency to cause tetanus. This differs from the generally accepted view and so the controversy has begun again.

Ergot is acknowledged to be the sovereign remedy for relaxation of the uterus following the expulsion of the placenta, but likely to cause some embarrassment if used during the third stage of labor. With reference to the use of ergot early in labor, Schatz, by means of the tokodynamometer, showed that small doses of ergot would increase the force of the uterine pains, without tetanus. But he also called attention to the difficulty of getting the exact dose required. Others tried fractional doses and claimed excellent results, but the weight of opinion has been, and still is, to wait until the end of the third stage.

It would seem that these difficulties are not inherent in ergot itself, but in the preparations of ergot, which deteriorate rapidly. The crude drug itself varies greatly in value according to conditions of growth which vary from season to season, and from district to district in which the ergot grows. These facts shift the problem to the pharmacologist or to the chemist, at least from the clinician for the present.

In view of all these facts, it is not to be wondered at that Hofbauer's communication in 1911, in regard to extracts from the hypophysis, was received with great interest. In 1885, Pierre Marie had first called attention to a relation between the genitalia and the hypophysis, in noting that there was some connection between acromegaly and tumors of the hypophysis. The etiological significance has been made clearer by surgery, in that removal of the tumor relieves and sometimes cures the symptoms. The description of Froehlich in 1901 of the clinical picture known as dystrophia adiposogenitalis showed that there were metabolic relations between hypophysis and sexual organs. Among other signs there is defective development of the secondary sexual characteristics. In the female, the hypophysis increases in size, during pregnancy, with fairly characteristic changes which regress after labor, but never entirely disappear. Increase in size of the hypophysis is found also following castration and in the senium, according to some investigators.

The effect of the secretion of the gland on the uterus was first determined by laboratory experiments in 1909 by Kehrer and by Dale. Clinical possibilities were at once recognized,

and it was soon used to control post partum hemorrhage and as a prophylactic in Cesarean section. Two years later Hofbauer used the extract to stimulate and strengthen labor pains, since which time it has been widely employed for this purpose. Factors which have favored its free adoption are its relative constancy, permanency and uniformity of composition, in marked contrast with ergot.

The results are not uniform, but certain facts seem to be pretty well established. For example, the dose is about one-tenth of a gram of the gland substance, corresponding to one cubic centimeter of pituitrin, but varying somewhat with preparations of other manufacturers. Increasing the dose above this quantity does not seem to increase the action and such variations in result as appear seem to be due to variations in the susceptibility of the patients. For if the contents of a one cubic centimeter ampoule be divided equally between two patients, there may be a marked effect in one and no effect in the other.

It may be given subcutaneously, intramuscularly or intravenously. While there is little difference between the subcutaneous and the intramuscular injection, the latter method is generally preferred. It should be given intravenously only in an emergency to check post partum hemorrhage, for its action is not only almost immediate, but stormy and accompanied by unpleasant but not serious general symptoms. By mouth it has no effect. After intramuscular injection the action is evident in from five to fifteen minutes, though sometimes later; if there is no reaction from the first dose in half an hour, a second may be given. But if no reaction follows the second dose, the patient is considered refractory and no further injection should be made.

The effect on the uterus during labor is peculiar and characteristic, producing a type of pains which closely resemble the normal. There is an increase in the uterine tone, with an increase in the force of the contractions, and a shortening of the duration of the contraction as well as of the interval between the pains. The shortening of the interval is most marked at first when the pains may occur in such quick succession as to give rise to a tetanic contraction of several minutes' duration. But generally no tetanus results, the interval, though short, being clearly defined. The effect lasts for about an hour, with its acme in the first half hour, and is generally not followed by a period of noticeable relaxation. It seems more active the nearer the patient is to physiological term, and if in labor the nearer the patient is to the end of labor. But in inducing labor it is of no value.

In regard to its use after the birth of the child there is wide difference of opinion, indicating that more study and observation are necessary to clear up this aspect of the question. Its injection has been recommended at the moment of birth to diminish normal bleeding and is undoubtedly valuable for intravenous use in post partum hemorrhage, where it acts promptly and uniformly. Thus it removes the need for intrauterine manipulation and to that extent diminishes the danger of infection.

Certain reports on the use of pituitrin would lead us to think of it as almost a panacea, with no failures, no bad effects and no contraindications. But a more thoughtful study of cases and a review of the literature show that it sometimes fails and sometimes does serious harm.

The failures ought to be studied with great care. They may be divided into two groups: first, those in which there was no uterine reaction—found chiefly in elderly primiparae and in women with undeveloped uteri; second, those in which the reaction was not of sufficient force to produce the expulsion of the child. It is this second group that especially demands attention, for here are the cases in which the misuse has been most obvious.

The bad effects outside the uterus are occasional, but never serious, at least as hitherto reported, and consist of pallor, faintness, cyanosis and irregularity of the pulse. The serious bad effects are in causing tetanus of the uterus which had led to asphyxia of the child and occasionally to rupture of the uterus.

The indications for the use of pituitrin may be summarized briefly. But before it is administered a careful examination should be made to determine whether the child can be born through the birth canal. The cases of rupture of the uterus have come chiefly from the neglect of this precaution. If it seems probable that the child can be so born, pituitrin may be given, first, for uterine inertia in the first or second stage. It has been recommended for both primary and secondary inertia, but I am inclined to be very cautious in its use before the cervix is dilated two and one-half inches.

The second group of cases comprises several subdivisions: those cases in which labor pains are normal, but for some definite cause increased activity is needed, as in a breech and occasionally in a face presentation; if the disproportion between the presenting part and the pelvis is slight; to avoid exhaustion of the mother from undue prolongation of labor; in eclampsia in connection with dilating bag. The only indication that needs comment is the use in eclampsia. Some have feared the dangerous effect of the rise in blood pressure, but this is not great, and I think we have a choice of evils, of which I consider the rise of blood pressure less than the prolongation of labor. It may also be used as a prophylactic against bleeding in Cesarean section.

A word should be said about adrenalin in this connection. Its effect in producing uterine contractions was noticed in 1901, but the study was not prosecuted with much vigor at first, and later interest was distracted by pituitrin. But it is the most powerful and promptly acting

oxytocic that we have, causing contractions in dilution of one to two hundred millions, and producing a powerful effect in dilution of one to fifty million. It is contraindicated during labor because it produces tetanus, but for post partum hemorrhage it is prompt and efficacious though temporary in its effect. It is best injected into the uterine muscle, as intravenously it is dangerous and subcutaneously not very effective. Ten minims of the one to one thousand solution may be injected into the wall of the uterus as high as may be reached on pulling down the cervix.

Original Articles.

A STUDY OF THE SYMPTOMS AND TREATMENT OF CONGENITAL TRANSDUODENAL BANDS.

BY JOHN HOMANS, M.D., BOSTON,

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THE investigation, of which the results are here presented, has been undertaken to throw light upon the question whether transduodenal bands of congenital origin give rise to such symptoms as to cause them to be considered a pathological entity, having a definite course, symptomatology, and treatment.

The most convincing exposition upon this subject was made several years ago by Dr. M. L. Harris.* Following the teaching of various anatomists, he holds the bands to be remnants of the original anterior mesentery of the upper gut, which, persisting after rotation of the stomach and duodenum in foetal life, remain stretched from the gall bladder and inferior surface of the liver across the duodenum to the region of the hepatic flexure. In general, the cases described by Harris run a long course, their symptoms resemble in certain respects both those of gastric and duodenal ulcer as well as chronic gall-bladder disease, and the Roentgen examination gives evidence of dilatation of the first portion of the duodenum.

Having met with a number of instances of these bands or adhesions, it has seemed to me worth while to make a study of all such cases occurring over a period of several years at the Peter Bent Brigham Hospital. There are now available eleven cases in which definite bands passing from the gall bladder and liver across the duodenum have been found, and in which gastric or duodenal ulcers or gall-bladder disease have been held to be absent. The symptoms of these cases have been tabulated for comparison with a series of six duodenal ulcers and six gastric ulcers, picked out at random, one combined gastric and duodenal ulcer, eight cases of chronic cholecystitis with and without stones, and two cases of chronic appendicitis with reflex gastric symptoms. The late results in all patients whose bands have been divided are of course known.

The lesion, as I have met it, can best be described by quoting from one or two operative records and by reproducing a sketch made at operation. The first: (Surg. No. 3934, J. McG., Case IX.)

> "There were a number of adhesions, apparently of a congenital type, passing between the lower part of the gall bladder and the cystic duct across the duodenum to the region of the head of the pancreas. These did not appear to indent or constrict the duodenum .....
> There was another band of adhesions, narrow and rather tight, which passed from a point just proximal to the pylorus to the liver itself rather high up beneath the inner part of the right lobe mesial to the gall bladder. These adhesions made a slight constriction in the upper part of the duodenum at about the point indicated in the x-ray as the seat of ulcer. After dividing these adhesions it was possible to feel exactly the whole duodenum and pyloric region and no induration or deformity could be made out."

Or again (Surg. No. 4247, D.T., Case XI., Figure I.)

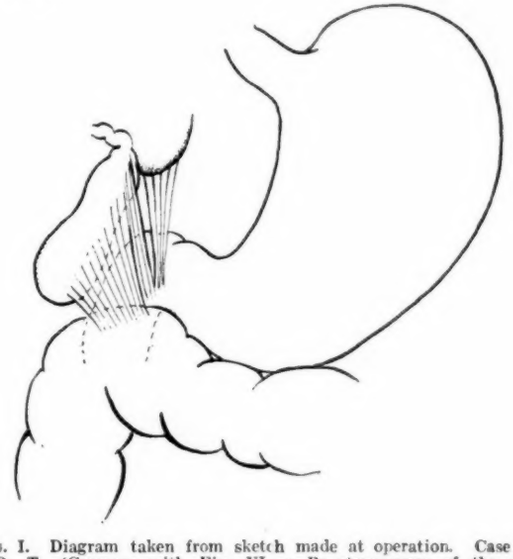

FIG. I. Diagram taken from sketch made at operation. Case XI, D. T. (Compare with Fig. VI, a Roentgenogram of the same patient.) The gall bladder is attached to the hepatic flexure by a broad, flat band of adhesions passing across the duodenum. A second smaller band passes from the liver to the lower border of the pylorus indenting the duodenum slightly.

> "At a point just below the pylorus a very broad band of what appeared to be congenital adhesions attached the gall bladder, from a point beginning at the cystic duct downward for perhaps an inch and

* Harris, M. L.: Constrictions of the Duodenum Due to Abnormal Folds of the Anterior Mesogastrium. Jour. A. M. A., 1914, Vol. lxii, pp. 1211-1216.

a half toward the fundus, to the hepatic flexure of the large intestine and to the inferior surface of the pylorus just above this point."

Or again: (Surg. No. 1759, M.A.S., Case III.)

"Extending from the region of the head of the pancreas to the lower border of the pylorus was a small scar-like band. Where this band came to the pylorus there was a larger and more stellate scar, which, however, was not in the stomach wall but in the peritoneum with fat under it, evidently not the result of an ulcer, but an old congenital band. From this scar ran a much stronger, rather funnel shaped band across the junction of the first and second portion of the duodenum to the neck of the gall bladder where it finally spread out over half the surface of the gall bladder. This band made a pronounced indentation in the duodenum, evidently causing a kink if not an absolute obstruction."

These bands as described have a strong family resemblance to those congenital remains not uncommonly found at autopsy in infants and others. The frequency with which they appear at autopsy is uncertain, but I am very kindly permitted by Dr. S. C. Harvey to quote from a paper as yet unpublished to the effect that among 105 infants a condition of this sort was found by him 20 times.† It is not pretended that these bands are pathologic or, indeed, that they necessarily give rise to any symptoms. Holding such bands to be the object of this investigation, and excluding simple exaggerations of duodenal fixation as well as adhesions obviously resulting from ulcer or cholecystitis, I have analyzed the symptoms of eleven cases which presented this condition at operation.

Age and Sex. There were six males and five females, the average age of both being forty-four years, the youngest nineteen and the eldest sixty-seven.

Duration of Symptoms. The average duration of symptoms was eight to nine years. Two patients had suffered with gastric disturbances for twenty years and one for only four weeks. Curiously enough the latter was the oldest in the series, sixty-seven. She had had pneumonia severely some months before and had been left with a weak, irregular heart. She failed rapidly after her gastric symptoms appeared and was thought to have cancer. A novocaine exploration revealed a transduodenal band constricting the duodenum. The band was divided, affording considerable relief from her digestive disturbances, but her general condition continued to decline and she died a month after leaving the hospital, of unknown cause (cardiac probably). The death of this patient before any definite proof could be offered that division of the band had proved curative makes it doubtful whether the anatomic lesion was in reality responsible for the gastric symptoms. The x-ray studies before operation disclosed an atonic, dilated stomach and no irregularities in the outline of the pylorus and duodenum. If, then, the band was of any importance symptomatically it could only have affected the stomach in a reflex way in connection with the sudden enfeeblement of the patient from other causes.

Character of Symptoms. The gastric disturbances have been analyzed under the convenient headings of intermittency, food relief, vomiting and bleeding, but their general character as well may be compared with that of other lesions. The complaints include "sour stomach," epigastric discomfort, fulness and gaseous eructations, a dull ache in the epigastrium with exacerbations, and dull, aching pain in right side of the epigastrium with knife-like exacerbations. In general there has been no radiation. There has been night pain in some instances, and sometimes pain before breakfast. Comparing these complaints with those of duodenal ulcer, it appears that in many instances the complaint is similar to the familiar, dull, distressing ache and gnawing discomfort of the latter, but that the patients suffering from trans-duodenal bands have a greater variety of symptoms. In this respect they present more the picture of gastric ulcer, and again the irregular time of appearance of the pain or discomfort is more like that of gall stones, though with the latter a large proportion of cases have, beside their "indigestion," a history of characteristic radiating gall-bladder colic.

Intermittency. Out of eleven cases, five had some intermissions in the steady development of their symptoms. These were irregular and not at all noteworthy, only one case having a resemblance to the typical course of duodenal or gastric ulcer. In general, the patient's discomforts were steadily present, much more so than among the gall-bladder cases among whom four out of seven had had irregular intervals of freedom, and in marked contrast with the gastric ulcer group, in all but one of which, an acute case of one month's duration, periods of complete relief were marked, and to those suffering from duodenal ulcer, among whom typical remissions were the rule. In this respect the symptoms of trans-duodenal bands resembled exactly those due to chronic appendicitis as studied in only two well-marked cases. It appears, then, that in respect to remissions, the bands are responsible for symptoms resembling in their lack of periodicity those due to reflex causes.

Food Relief. In six of the eleven cases food relief was noticeable and when present was of fairly long duration. That is to say, it more resembled that of pyloric or duodenal ulcer than that of ulcer of the lesser curvature. In the other five cases in which it was absent, the dis-

† For reference to this and allied conditions, together with a presentation of the literature upon these congenital folds, the reader is referred to Dr. Harris's paper and to that of Dr. Harvey, presently to be published, entitled "Congenital Variations in the Peritoneal Relations of the Ascending Colon, Caecum, Appendix and Terminal Ileum."

comforts had no relation to the taking of food or were immediately excited by it. In the latter respect the band cases resembled the instances of chronic appendicitis with reflex gastric disturbances. When the pain or distress bore no relation to the taking of food there was a closer resemblance to the indigestion of gall-bladder disease. There was, then, evidence in regard to the relief afforded by eating, that this symptom was less common than in gastric or duodenal ulcer and much more common than in gall bladder or appendicular disease. When, however, food relief was present, it tended to resemble that of pyloric or duodenal ulcer.

Vomiting. This symptom is so erratic in its appearance in ulcer cases that a comparison of these small series is hardly of any value, yet it may be significant that in the band cases it was present six out of eleven times, in duodenal ulcer not at all in six cases, in gastric ulcer five times out of six, and in gall-bladder disease four out of seven times. The symptom of vomiting, therefore, brings out again a similarity to gastric ulcer or gall-bladder disease.

Bleeding. No history of hematemisis was obtained from the patients suffering from bands, blood was never found in the stomach washings, and in only one case was there a story of bloody or tarry stools. The history in this instance was considered unreliable as the patient had previously been told she had an ulcer and was inclined to make the most of her symptoms. If there had indeed been haemorrhage, the source was not found at operation, but on the other hand a very deforming trans-duodenal band (the most completely so in the series). This absence of bleeding is to be compared with the conditions in gall-bladder disease in which a history of tarry stools was noted in one instance, in gastric ulcer, with which it was noted five times out of seven, and in duodenal ulcer, with which it was noted twice out of six.

Gastric Analysis. The familiar measurement of the free hydrochloric and total acids in the gastric contents proved to be of no diagnostic value in this series. In some instances the acidity was low or normal, in two instances free hydrochloric acid was absent, in another it was high at one time and absent at another, and in several cases there was present a continuous secretion of free hydrochloric acid for a number of hours after the test meal.

Roentgen Examinations. Studies in gastric and duodenal motility and in the position and outline of the stomach and duodenum showed abnormalities in all instances of well developed trans-duodenal bands in which this examination was made. Of the eleven cases, however, nine only were studied, and of these, one, the woman of sixty-seven already noted as of doubtful importance, presented merely a low atonic stomach. The findings in the other eight may, however, be used as a basis for study. There were three instances of duodenal defects, two of dilatations of the upper duodenum, one of hour-glass stomach, one of normal duodenum with gastric hyperperistalsis and one of normal duodenum with atonic stomach. As a rule bismuth passed through the duodenum so rapidly as to make a record of duodenal irregularities difficult to obtain, but the pylorus was generally regular in outline.

The Roentgen findings are, therefore, much more like those of duodenal than gastric ulcer, the one exception being the instance of gastrospasm, which of course is more common as an accompaniment of the latter than the former. But even here the spasm was so variable that, not being accompanied by any typical ulcer defect, it was correctly attributed before operation to reflex causes outside the stomach.

Diagnosis. Before describing very briefly the individual cases, it may be interesting to assemble the pre-operative diagnoses which were as follows: (1) "Cholecystitis with adhesions," (2) "Cancer," (3) "Gall stones or gastric ulcer," (4) "Cholecystitis or duodenal band," (5) "Duodenal ulcer or appendix," (6) "Duodenal ulcer or band, plus cancer somewhere in abdomen," (7) "Chronic appendix, ulcer or constipation," (8) "Pyloric ulcer, question of cancer," (9) "Duodenal ulcer," (10) "Gall stones," (11) "Duodenal ulcer, question of duodenal band." This list makes a poor showing in respect to the accuracy of diagnosis in the presence of this condition. It may perhaps be summarized more intelligibly.

A diagnosis of duodenal ulcer was made four times and was twice bracketed with band.

A diagnosis of gall stones or cholecystitis was made four times; was bracketed with gastric ulcer once, with band once, with "adhesions" once.

A diagnosis of cancer was made once.

A diagnosis of gastric or pyloric ulcer was made once and cancer bracketed with it.

A diagnosis of chronic appendicitis, ulcer or constipation was made once.

This variety in diagnosis is to be contrasted with the six analyzed cases of duodenal ulcer in all of which a pre-operative diagnosis of duodenal or pyloric ulcer was made, and with the gastric ulcers, in all of which a correct diagnosis of gastric ulcer was made. As for the gall-stone cases, the correct diagnosis was made in all the eight cases picked out at random.

It appears, therefore, that cholecystitis, duodenal and gastric ulcers are not likely to be mistaken for bands, but that bands may simulate the appearances of these other lesions, especially duodenal ulcer and cholecystitis.

Finally, and in the light of these attempts at diagnosis, a re-analysis of the various symptoms shows that:

The general character of the patient's complaint tends to resemble that of ulcer or gall-bladder disease, but gives the impression of a reflex symptom-complex.

In respect to intermittency, the symptoms re-

semble gall stones or chronic appendicitis rather than ulcer.

In respect to food relief, the symptoms resemble those of gall stones and chronic appendicitis rather than gastric or duodenal ulcer, but when food relief is present it simulates duodenal or pyloric ulcer in type.

In respect to vomiting the disease is rather like gastric ulcer or gall stones.

In respect to bleeding, band cases present negative findings.

In Roentgen ray studies the band cases tend strongly to imitate duodenal ulcer.

PROTOCOLS.

CASE I. J. McD. 565. November, 1913. A nervous, apparently hysterical woman of 38. Indigestion for nine years, constipation. Attacks of pain and distress suggestive of gastric spasm for two years. Recent loss of fifteen pounds in weight. Intermittency (of indigestion), none. Food relief, none. Vomiting, present. Bleeding, none. Chemical examination, normal. Roentgen examination, long, hook-shaped stomach, slight atony, normal pylorus and duodenum. Pre-operative diagnosis, "Cholecystitis with Adhesions." Operative findings, a normal stomach, tight pylorus, duodenum in general rather thick and firm, adhesions across duodenum to head of pancreas. Operative treatment, division of adhesions, pyloroplasty (Finney) during which, mucous membrane of duodenum was found to be normal. Result, immediate, incomplete relief. After several months, complete relief, good gain in weight. At present well.

CASE II. S. M. A. 1458. July, 1914. A worn-out woman who had never fully recovered from a recent pneumonia. Age 67. For four weeks constant pain in pubic region radiating to epigastrium, back, and both sides. Good appetite, constipation. Marked loss of weight. Intermittency, none. Food relief, none. Vomiting, none. Bleeding, none. Chemical, free hydrochloric acid absent. Roentgen examination: low, dilated atonic stomach, regular pylorus and duodenum. Pre-operative diagnosis: cancer, location undetermined. Operative findings (novocaine exploration), general visceroptosis. First portion of duodenum dilated. Band containing fat and blood vessels passing from gall bladder to hepatic flexure and lower border of pylorus constricting duodenum. Operative treatment, band divided. Result: Improvement in digestion, increasing cardiac irregularity, high blood pressure and general debility. Death soon after leaving hospital (exact cause unknown).

CASE III. M. A. S. 1759. September, 1914. An apparently neurotic woman of 41. For six years steadily increasing distress coming on 1½ to 2½ hours after eating. Recently constant "burning" in epigastrium and dull aching pain. Frequent attacks of "faint feeling" with hunger in epigastrium. No loss of weight. Intermittency, none. Food relief, present in early stages, less now than formerly. Vomiting, present, not of food eaten. Bleeding, questionable. (Patient claims to have noticed bleeding since hearing that she had a gastric ulcer). Chemical, only a few drops of strongly acid fluid recovered. Roentgen examination: hypertonic stomach, deep peristalsis, pylorus and duodenum defined and regular. Pre-operative diagnosis, "Gall Stones or Gastric Ulcer." Operative findings, normal gall bladder and stomach, a broad band containing fat and blood vessels passes from gall bladder (indenting duodenum) to inferior border of pylorus and on from there to head of pancreas. No evidence of duodenal ulcer. Operative treatment, excision of band. Result, for a few days no relief. From then on while in hospital complete relief. Was operated upon a year later at another institution (appendix, haemorrhoids). June, 1916. States that her indigestion and attacks of "faint feeling" in epigastrium were relieved by the first operation. Confesses to a fondness for pastry, etc., and says that if she eats sensibly she has very little trouble. Looks well.

CASE IV. M. A. O'K. 2715. April, 1915. A normal appearing girl of 19. For four years "sour stomach" at times. For three months, dull ache in epigastrium with exacerbations. Intermittency, at first present, later absent. Food relief, none. Vomiting, occasional. Bleeding, none. Chemical: fractional meal, first hour normal HCl, second hour diminishing HCl. Roentgen examination: hour-glass stomach, deep peristalsis, normal pylorus and duodenum. Pre-operative diagnosis, "Cholecystitis or Duodenal Band." Operative findings, normal gall bladder and stomach, broad band passes from gall bladder across (but not indenting) duodenum to lower side of pylorus. Operative treatment, division of band and removal of atrophic appendix. Result. Stormy early convalescence, then complete relief while in hospital. Later, one or two milder attacks of epigastric pain (none for eight months) and now considers herself nearly but not quite well.

CASE V. H. C. H. 2803. April, 1915. A stout, pallid man of 41. For twenty years indigestion appearing one to two hours after eating, recently colicky pain at same interval and occasional fainting attacks. No loss of weight. Intermittency, present, as in duodenal ulcer. Food relief, present. Vomiting, occasional. Bleeding, none. Chemical, on several examinations, HCl increased or absent. Roentgen examination, gastric hyper-peristalsis, irregularity of first portion of duodenum (Figure II), giving impression of duodenal ulcer. Pre-operative diagnosis, "Duodenal Ulcer or Appendix." Operative findings, friable gastric wall with no evidence of ulcer, small tight pylorus, a stellate scar associated with vascular adhesion passing from lower surface of liver across duodenum which was firmly fixed to liver. No induration of duodenal wall. Scar thought to be an old ulcer. Operative treatment, gastroenterostomy with plastic on antrum for purpose of exclusion. Result. Death from bronchopneumonia. Autopsy, no evidence of duodenal ulcer even on careful microscopic section of duodenal wall.

CASE VI. G. F. S. 3193. June, 1915. A man of 56. "Sour stomach" for 20 years. For last six years attacks of violent pain in early morning, starting at umbilicus and radiating to left, followed by dull grinding sensation. All symptoms worse recently, and has lost ground. Intermittency, none for indigestion. Food relief, present to some extent for many years but not recently. Vomiting, formerly some, recently none. Bleeding, absent. Chemical, hypersecretion of HCl, increasing in

Fig. II. Case V, H. C. H. Duodenal defect thought to indicate ulcer. At operation a band was found. At autopsy, three days later, there was no evidence of ulcer.

second hour. Roentgen examination, prompt emptying, normal outline of stomach and duodenum, stasis in second portion of latter. Pre-operative diagnosis (a mass was felt in abdomen, hard and fixed to left of umbilicus) "chronic duodenal ulcer or band and cancer elsewhere in abdomen." Operative findings. Normal stomach, typical, fan-shaped band from gall bladder across duodenum to head of pancreas—duodenum compressed but not creased. Cancer of pancreas (inoperable, the growth occupied the tail of the pancreas to left of median line). Operative treatment, division of band. Result. Stormy early convalescence followed by relief for several weeks, after which his condition rapidly declined, his indigestion returned, and he died at home three months after operation. No autopsy.

Case VII. M. A. McC. 3588. September, 1915. A neurotic appearing man of 30. For three months gastric discomfort immediately after meals, dull aching pain to right of umbilicus, with knife-like exacerbations beneath right costal margin. Intermittency, absent. Food relief, absent. Vomiting, present. Bleeding, absent. Chemical, continuous low acid secretion for several hours. Roentgen examination had been made in another institution and was not repeated. Pre-operative diagnosis: chronic appendix, gastric ulcer or constipation. Operative findings: normal stomach, light band from middle of gall bladder across duodenum, normal looking appendix. Operative treatment, division of band, appendicectomy. Result. For several weeks nervous and complaining, later gradual steady improvement in all respects with return to work and gain in weight, but still has to exercise care in eating.

Case VIII. S.A.D. 3712. October, 1915. A stout, rather prematurely old appearing man of 50. For 18 years, discomfort and gaseous eructations following three to four hours after meals. Formerly some epigastric pain in early morning. Constant hunger. Constant diarrhoea for 12 years. Recent loss of weight. Intermittency, absent. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, constant anacidity. Roentgen examination, hyperperistalsis and much dilated pylorus and first portion of duodenum. Beyond this point duodenum emptied rapidly and could not be outlined. (Figure III). Pre-operative diagnosis, chronic ulcer with question of cancer. Operative findings, stomach normal, pylorus large. First portion of duodenum enormous. Broad band from gall bladder across duodenum to hepatic flexure compressing but not creasing duodenum. Operative treatment, division of band. Result, prompt improvement steadily continued for ten months (to date). Has to take HCl for his diarrhea. Gain above normal weight.

Case IX. J. McG. November, 1915. An ignorant, rugged man of 42, somewhat alcoholic. Epigastric pain 3, 4 or 5 hours after eating, not coming after every meal, often at night, recently replaced by discomfort and "rumbling" of gas. Soda relief. Recent loss of weight. Intermittency, present, irregular intervals. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, hypersecretion, highly acid, continuing over several hours. Roentgen examination: normal stomach, no stasis, defect in anterior upper portion of duodenum (Figure IV). Rapid passage of food through duodenum. Pre-operative diagnosis, duodenal ulcer. Operative findings, two distinct bands; the upper from lower surface of liver close to and above gall-bladder across first portion of duodenum (indenting it) to pylorus; the lower, from gall bladder and cystic duct across duodenum to head of pancreas not indenting duodenum. Normal stomach and appendix. Operative treatment, band excised. Result, immediate improvement but not complete relief. Roent-

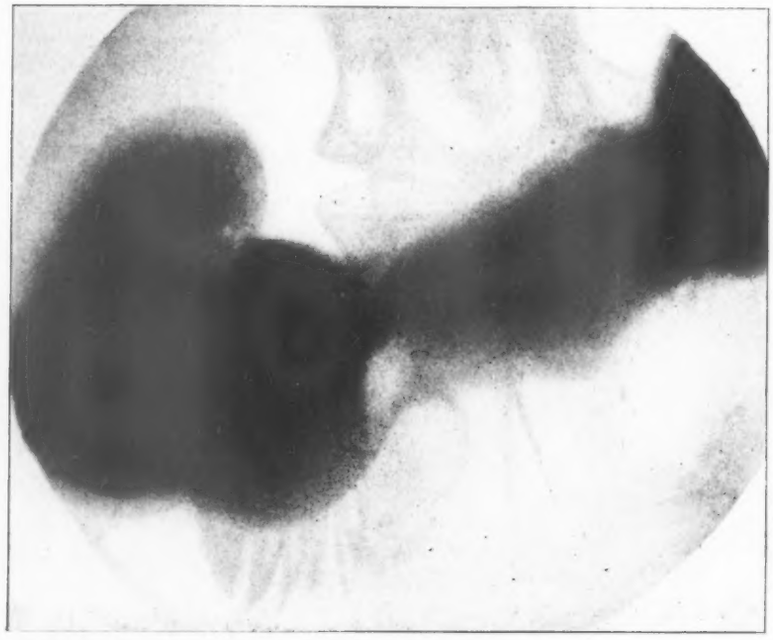

FIG. III. Case. VIII, S. A. D. Huge dilatation of duodenum associated with a band. First portion of duodenum larger than pyloric antrum.

gen examination three weeks after operation shows duodenum more deformed than before (Figure V). Steady gain under careful diet. Six months after operation, well.

CASE X. I. M. H. 3945. December, 1915. A stout woman of 53, self-indulgent in eating and careless in habits of eating. For three years epigastric pain "dull and aching," coming on sometimes early and sometimes late after eating. Recently night pain. Intermittency, none in sense of periodicity, but relief in periods of careful diet. Food relief, absent. Vomiting, absent. Bleeding, absent. Chemical, not made. Roentgen examination, only for gall-stones, thought to be present. Pre-operative diagnosis, gall stones. Operative findings, normal gall bladder and stomach. A broad fan-shaped band passes from gall bladder across (not constricting) duodenum to lower side of pylorus. Normal appendix. Operative treatment, band divided. Result, no improvement for 10 days. Then steady improvement with relief of symptoms

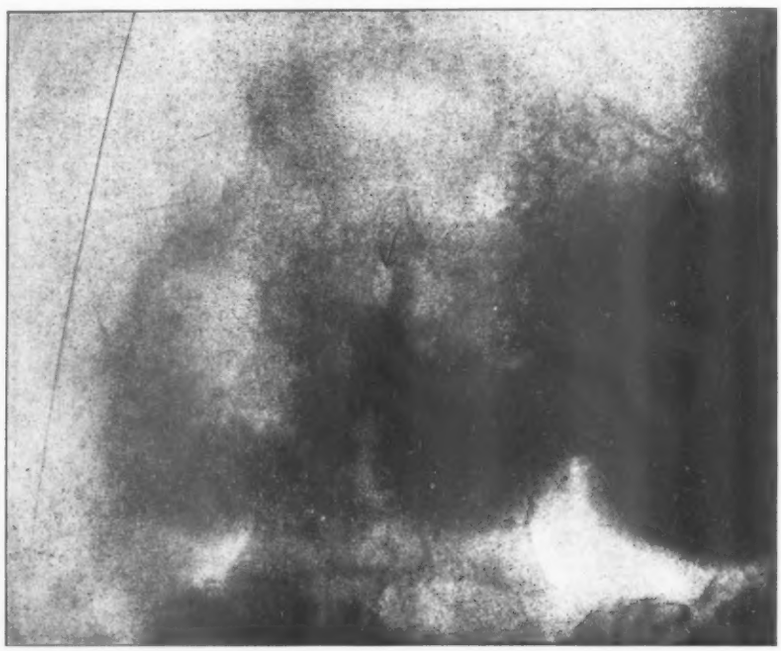

FIG. IV. Case IX, J. McG. Before operation. Duodenal defect associated with deforming band.

Fig. V. Case IX, J. McG. After operation. Note increase in deformity following operation as compared with Fig. 4. The band has been excised.

except on indiscretions of diet to which she is subject. Gain in weight.

Case XI. D. T. 4247. February, 1916. A rugged man of 49. For 10 years dull pain two to three hours after eating. These symptoms were ushered in by two severe attacks of epigastric pain following indiscretions of diet. Soda relief. Has since been on careful diet. Gradual loss of weight. Intermittency absent, but there have been a few free intervals. Food relief, present. Vomiting, absent. Bleeding, absent. Chemical, fractional examination shows irregular secretion of acid, high at end of first hour. Roentgen examination, gastric hyperperistalsis. Rapid passage of food through first portion of duodenum, making outline difficult to obtain, but plates show defect in first portion. (Figure VI.) Pre-operative diagnosis, duodenal ulcer, question of band. Operative findings, normal stomach, pronounced band from liver and gall bladder cross-

Fig. VI. Case XI, D. T. Duodenal defect associated with a deforming band. Compare with Fig. 1, a sketch made from the same patient at operation. The duodenum was opened and no evidence of ulcer found.

ing and indenting first portion of duodenum to lower side of pylorus (Figure 1). On opening duodenum, mucous membrane and wall found to be normal. Appendix could not be seen. Operative treatment, division of bands, Finney pyloroplasty. Result, stormy convalescence with attacks of vomiting, followed by complete relief, ability to eat anything, and gain weight. Four months after operation, perfect health.

Treatment. At first sight the treatment of this condition may seem simple and yet I am inclined to think that division of the bands, or even excision and the inversion of surfaces bare of peritoneum, may not always prove satisfactory. In two instances I have opened the duodenum and performed a Finney pyloroplasty with more completely satisfying relief than in the majority of cases in which the bands were merely divided or extirpated. In the first instance (Case I), upon whom I operated before the publication of Harris's paper, the pylorus was so firm and tight as to appear pathological and demand examination of the mucous membrane. There was, however, upon splitting the pylorus, no evidence of ulcer past or present, and a plastic operation was done to obviate any possibility of subsequent narrowing. In the other (Case XI) the Roentgen plates showed such a definite duodenal defect that though I felt that the band which indented the first portion must alone be responsible, yet I thought it only fair to the patient to open the bowel. Both mucous membrane and duodenal wall were completely normal and a plastic closure with widening of the pylorus was demanded by the character of the incision.

There may, however, be a good reason for the excellent results in these two chance observations. Carman* has recently pointed out that duodenal defects accompanying ulcers are quite possibly due to spasm of the duodenal wall, and an operation which sets at nought spasm, often perhaps of many years' standing, may reasonably be expected to be more effective than simple removal of the originally exciting cause of the spasm. This conclusion is quite tentative, however, and it must be admitted that division or excision of bands without the plastic is quite satisfactory.

Another observation (Case IX) casts still more light upon the relation of the duodenal defect seen in the Roentgen plates to transduodenal adhesions and their treatment. In this instance the pronounced defect seen in the plates (Figure IV) made a diagnosis of duodenal ulcer appear obvious and yet at operation only a deforming band was found. Under full anaesthesia, the duodenal wall was so normal in appearance and so free from any sign of ulcer on palpation that it was not considered necessary to open the duodenum. Accordingly the band was divided and nothing more was done. Three weeks after operation, however, bismuth studies showed more deformity than ever, and in the language of the Roentgenologist, "the duodenum appeared as an irregular sinus." (Figure V). There can be no question, therefore, that spasm alone was responsible for the duodenal deformity, band being the apparent cause, and it was the persistence and even accentuation of the deformity that caused me to open and explore the duodenum in a subsequent case (Case XI) and to perform a Finney pyloroplasty. A comparison of the Roentgen plates in these two cases will show the obvious similarity between them (Figures IV and VI), and indeed, the symptoms in each were much alike. The results, however, though too recent to be considered final, speak in favor of the plastic operation, though the patient, who was subjected only to division of the band, has steadily improved under careful diet and bids fair to be well.

Results. All cases but one have been followed for periods of two and a half years in the first case to four months in the most recent. Of the eleven, two patients died of other diseases within a few weeks or months of operation. Both were improved but not completely relieved of their gastric symptoms. Another patient died of bronchopneumonia immediately after operation.

Of the eight living patients who have been traced to the present time, all are well or so nearly so as to express themselves as satisfied with their condition. Several still have to exercise care in their diet. Division of the bands may be said, then, to have been curative, with this reservation,—that division of the bands plus a plastic operation (Finney) has given more completely satisfying results.

Relation of Transduodenal Bands to other Lesions. A great many surgeons who have met these bands at operation have undoubtedly regarded them as a chance finding which, though unimportant, has saved them from the ignominy of a negative exploration. Moreover, owing to the very generally "reflex" character of the symptoms in such cases, operators are perhaps inclined, in addition to dividing the band, if indeed they consider this worth while, to remove a questionably abnormal appendix or gall bladder, and are thus at a loss to place exactly the credit for such subsequent improvement as their patient may make. For this failure the very ease and safety of much of the present-day abdominal surgery is responsible, but it is to be hoped that greater surgical self-restraint, together with a more perfect coöperation between patient and surgeon in the study of late results, may clear up this and many similar matters.

It is such a feeling which has led me to refrain from opening the duodenum in certain of the cases of this series, and I have carefully explained to such patients that their future health is, so to speak, "sub judice." By giving the treatment of these bands a fair chance, one

* Carman, R. D.: Spasm of the Stomach and Duodenum from a Rontgenologic Point of View. Jour. A. M. A., 1916, Vol. lxvi, p. 1283.

may indeed be able not only to add to our understanding of their pathology but to make an important contribution to our knowledge of duodenal ulcer with which the Roentgen studies in this series show the bands may be confused. In this respect Carman's recent exposition upon the subject of duodenal spasm seems to me particularly important. If duodenal defects, as seen in Roentgen examinations, are always to be held as due solely to ulcer, then trans-duodenal bands may be of little importance and can be held responsible for symptoms only when they obstruct the bowel. In other words, the failure to find ulcer in instances of duodenal defects accompanied by bands is due to the operator and not to the absence of ulcer. On the other hand, if bands themselves, through spasm, can be held responsible for duodenal defects, it is probable that many diagnoses of "duodenal ulcer," when a band is present, are incorrect. The evidence adduced by Carman, that duodenal defects are very generally spasmodic constrictions excited by ulcer, seems to me worthy of acceptance and in that case it is not too unlikely that a condition such as transduodenal band may bring about a similar spasmodic deformity. In the small Brigham Hospital series three instances of typical deformities were noted in the Roentgen studies and attributed before operation to ulcer. No ulcers were discovered at operation in these cases, which have already been described in full (Case v, Figure II; Case ix, Figures IV and V; Case xi, Figure VI). They, therefore, support the contention that bands, in the absence of ulcer, may, by exciting spasm, be responsible for the defects, and they even suggest that in the presence of a trans-duodenal band a diagnosis of duodenal ulcer must be made only on strong evidence.

CONCLUSIONS.

1. Congenital trans-duodenal bands may be responsible for symptoms "reflex" in type, which have, in spite of considerable divergence, a definite family resemblance.

2. Accompanying these symptoms the Roentgen findings very generally indicate duodenal spasm or dilatation of the first, or first and second, portion of the duodenum.

3. Division of the bands and appropriate treatment of raw surfaces is satisfactorily curative, but plastic operations to widen the opening into the duodenum probably give the best results.

4. Congenital trans-duodenal bands, judging from the frequency with which they are reported at autopsy, are not necessarily pathologic, but may be responsible for digestive disturbances having a recognizable symptomatology, a prolonged course, and appropriate operative treatment.

INDICATIONS FOR WET PACKS IN PSYCHIATRIC CASES; AN ANALYSIS OF ONE THOUSAND PACKS GIVEN AT THE PSYCHOPATHIC HOSPITAL, BOSTON, MASSACHUSETTS.*

By Herman M. Adler, M.D., Boston.

Hydrotherapy has been in use in psychiatric hospitals for a long time, and all sorts of methods and theories have been employed with more or less success. Of late years, since the more modern ideas about hydrotherapy have gained the upper hand, elaborate provisions have been made in up-to-date hospitals for the application of Scotch douches, shower baths, needle baths, and so forth, whose effect has been reinforced by the use of steam baths, electric light baths, hot air, massage, and mechano-therapy.

The favorable experience of Kraepelin with the prolonged bath, which has been corroborated by numerous hospitals all over the world, served to establish this method as one of the necessities of a modern psychiatric clinic. Wherever the baths are consistently and intelligently given, strikingly good results have been observed.

Indications for giving baths have not, however, been very definitely set, so that the custom differs somewhat in the various hospitals where prolonged baths are given in the routine fashion. In general, the chief indication for giving a prolonged bath is restlessness. A patient becomes excited, noisy and violent, and is placed in a prolonged bath. Indications for the pack, on the whole, are the same as for the bath, except that the pack is especially indicated when the patient's ability to coöperate, or his suggestibility, is reduced to a negligible quantity. Mere excitement does not mean necessarily that hydrotherapy should be resorted to. It has been established that the chief signs are loss of body heat and loss of water.[1] These two apparently go hand in hand, and cyanosis of the exposed portions of the body, especially the face, hands and feet, is an index of the rapidity and the extent of the process. Hydrotherapy conserves the body temperature. It prevents the evaporation of water from the skin. It probably replaces some of the water lost, and it offers a gentle, mechanical restraint against sudden or violent gestures or motions.

The wet pack, as it is usually given, consists of a number of sheets wrung out in water at about 100°F, and wrapped tightly around the patient's body and limbs—so that he cannot move anything except his head, fingers, and toes—and an outside wrapping of blankets pinned with large safety pins, so that the patient cannot roll out of them. When the patient is so restless and active that in spite of

* Being S. B. I. Contribution No. 1916.6 (whole number 148). The previous contribution was by Robert M. Yerkes, entitled "The Use of the Binet Method in Hospitals for the Insane," to appear in State Board of Insanity Bulletin.

this, he is likely to fall out of bed in consequence of a flexion and extension of his entire body, a restraining sheet or blanket is placed over him and pinned to the sides of the bed, and the foot end of the pack may be attached by means of a blanket and safety pins to the cross bar at the foot of the bed. In this way, the patient is completely trussed and practically immobilized. In fact, this is so obvious, and the change from the violent agitation to the immobilization caused by the pack is so striking, that it must appear to many that the chief object of the pack is restraint, and is quite comparable to a strait-jacket or any other forms of restraint. As we shall see later, nothing can be further from the truth than this conception, and yet the similarity seems so great that even the attendants and nurses—not to say the physicians—frequently treat the pack as a form of restraint, and order it as a means of relief for themselves or the other patients from the disturbances caused by one who is merely noisy.

Where the degree of excitement is such that the gentle effects of the prolonged bath are not adequate, the restraining influence of the pack may be required to put the patient in the condition for the prolonged bath. The wet pack is applied for two hours. The patient is then removed whether he be still disturbed or not. If the patient has not fallen asleep or is not completely restored to quiet and self possession, he is then placed in the prolonged bath.

The ideal temperature for the prolonged bath is not over 98°F and not under 95°F. The water should be kept continually at this temperature, and the body should be immersed as far as possible in the water. The object of the pack is to produce an envelope of water or moisture-laden air at body temperature, and maintain this for the length of the pack. It has been shown that whether we start with cold water or warm water, the temperature of the pack readily adjusts itself to that of the body.[2] In cases of maniacal excitement, even though the patient may have fever, the surface of the body is losing large amounts of heat. It is wise, therefore, to start with hot sheets rather than cold sheets,—the idea being to conserve as much of the body heat as possible.

The patient should be given water to drink freely throughout the pack, and an ice-cap should be placed upon the head, and a cold compress on the forehead, which should be frequently renewed.

In cases of alcoholism or drug addiction, or in cases that have been exhausted by prolonged febrile diseases, there is a certain amount of danger from collapse in the pack. Following the experience in European clinics, as well as in this country, a hypodermic injection of digipuratum, or digalen has been given almost as a routine in these cases. The ordinary preparations of digitalis such as the powdered leaves, the tincture or the extract, require sometimes as much as twelve hours before the effect is obtained. They are, therefore, useless for this purpose. The hypodermic preparations are much more prompt in their action, and have given excellent results. Since the outbreak of the war, however, it has been impossible to obtain these drugs except at prohibitive prices, and stimulation with strychnin or camphor has been resorted to in cases in which there seemed to be a danger of cardiac collapse.

While the physicians who have been employing the pack in a proper fashion have all become convinced of the fact that it is a valuable therapeutic measure and in no sense to be compared to mere restraint, they have found this difficult to prove in individual cases; and in the face of charges brought by paranoid patients or their relatives, they have found it difficult to convince a prejudiced by-stander of the difference.

With these ideas in mind, a closer study was made of a thousand packs that had been given in the course of routine management of the patients at the Psychopathic Hospital, and the results of this study are herewith presented. These cases were gathered from unselected clinical material in the order in which they were given, and represent 309 patients. As will be seen from the table, the diagnoses, organic and psychiatric, comprise a large variety, and only one factor was taken into consideration in the present analysis, namely,—whether the patient was quieted by the pack or not.

According to this analysis, out of 309 cases, 155 were quieted by the packs, 56 were not quieted by the packs, 98 were quieted by some and not quieted by others, or, in other words, had a partial effect.

For the sake of convenience, I have grouped only the main classifications together. It will be seen that cases diagnosticated manic depressive insanity and dementia praecox are very nearly equal in number—79 of the former, 82 of the latter. But 326 packs were given in the 79 cases of manic depressive insanity, with a quieting effect in 144, without quieting effect in 218 packs, whereas in the 82 dementia praecox cases, only 217 packs were given, with quieting effect in 143, and without quieting effect in only 74.

The same disproportion is shown by the cases of manic depressive insanity showing agitated depression. In 8 cases 26 packs were given, 8 with quieting effect, 18 without quieting effect. In all the other groups, including general paresis, delirium tremens, alcoholic hallucinosis, and epilepsy, by far the majority of packs had a quieting effect.

It would seem, then, that excitement in conditions other than manic depressive insanity is to be considered rather as a secondary manifestation, and one which is more easily controllable by hydrotherapy. Even in the cases of manic depressive insanity, of course, a quieting effect was obtained a large number of times, but the packs that were given without quieting effect outnumbered those that had a quieting

effect, indicating, thereby, also that the duration of the state of excitement and the intensity of the excitement are greater than in the other diseases.

These results are quite different from those obtained by the use of restraint without hydrotherapy. It is unnecessary here to recall the remarkable improvement in the condition of excited patients produced by the modern methods of non-restraint, in which diversion and occupation take the place of padded cells, straitjackets, and strong rooms.

More to the point, perhaps, will be the startling figures obtained in a study of the treatment of delirium by hydrotherapy at the Psychopathic Hospital, Boston, compared to the results of the older methods of restraint and depressing drugs without hydrotherapy, employed at general hospitals. The mortality in general hospitals averages 26 per cent., the mortality in the Psychopathic Hospital, under hydrotherapy, more especially packs, averages 0 per cent.[3]

On account of these facts, it is safe to infer that hydrotherapy, whether applied in the form of prolonged baths or as wet packs, has a therapeutic effect, which is not to be obtained by mere immobilization of the patient or by restraint.

The question of restraint, of course, is an important one for administrative reasons. However, these figures prove that the wet packs not only cannot be condemned for reasons of cruelty, but that they are the most potent means of obtaining rest for a maniacal patient. The wet pack has been used at the Psychopathic Hospital consistently as an auxiliary to the prolonged bath, and bears the same relation to the latter that hypodermic medication bears to medication *per os*. A patient who cannot or will not swallow medicine may still derive the benefits from the drugs when they are administered subcutaneously. A subcutaneous injection of heart stimulant, for instance, may be applied against the wishes of an insane person. It may be applied in cases of unconsciousness and so forth. It offers a means of applying a therapeutic agent without the coöperation or even the consent of the patient. In the same way, the pack may be used to administer the beneficial effects of hydrotherapy, and in particular, of the prolonged bath, to patients who are so restless or excited that they cannot be induced to submit to the prolonged bath.

Diagnosis	No. of Cases	No. of Packs	Quieting Effect	Non Quieting Effect
Dementia Praecox....	82	217	143	74
Manic-Depressive Insanity:				
Manic	71	336	136	200
Depressed	8	26	8	18
Alcoholic Hallucinosis	20	40	28	12
Delirium Tremens....	20	34	21	13
Alcoholism	5	7	6	1
Organic Dementia....	4	14	7	7
Senile Dementia.....	4	6	5	1
Involution	3	4	4	0
Epilepsy	8	14	12	2
Paraphrenia	2	3	3	0

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JOHN CLARENCE CUTTER, M.D.

By Sarah H. Powers.

Dr. John Clarence Cutter was born in Warren, Massachusetts, July 10, 1851, eldest son of Dr. Calvin Cutter, the author of Cutter's Physiology, and Eunice Powers, a woman of the old school of culture.

After he received his education in the public schools of Warren, he entered the Agricultural College at Amherst, from which he was graduated in 1872. He spent a year in J. B. Lippincott's publishing house, then attended Dartmouth Medical School for two years, from which he went to Harvard Medical School, where he was graduated in 1877. Before he received his diploma he had gained the post of house surgeon in the City Hospital.

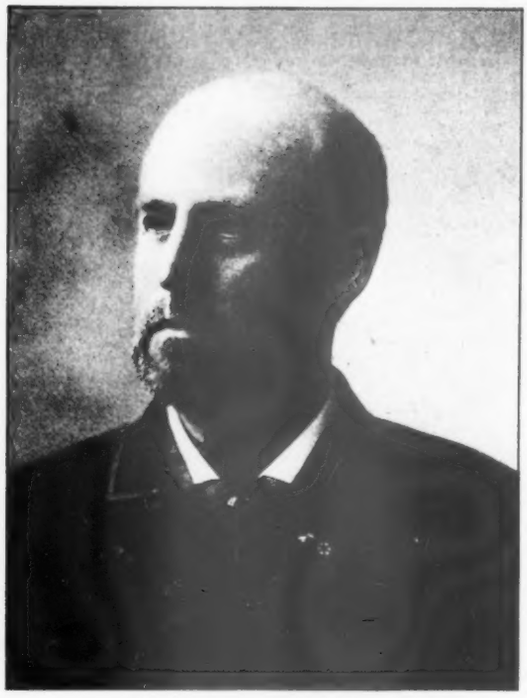
In 1878 he went to Japan to accept the position of professor of physiology and comparative anatomy in the College of Agriculture, Sapporo, Island of Yezo. When he arrived at Tokio he was made the consulting physician of the Imperial Colonial Department. His first contract with the government was for two years. He was liked so well, that he renewed it from time to time until he had been with the college nine years. At his mother's urgent request, he did not renew his contract in 1887, but came home through Europe. Before leaving Japan, the Emperor conferred on him the Order of the Rising Sun, Meiji, fourth class.

While in Japan, Dr. Cutter wrote several physiologies which were translated into Japanese. After his return home, he revised his father's books, which had been translated into thirteen different languages and printed in raised letters for the blind.

In 1888 he went to Berlin and Vienna to study skin diseases. In the fall of 1890 he opened an office in Worcester. Soon after coming to Worcester, while assisting another physician in performing an operation, he contracted blood poison from which he never fully recovered.

Dr. Cutter came from a long line of famous ancestors on his mother's side, born in Warren. In Colonial times, they were foremost in the life of the town; they fought in the Indian Wars, in the Revolution, in the War of 1812, and the Civil War.

Dr. Cutter "was energetic and possessed of forcible character. He had the courage of his convictions, and his fearlessness counted much



JOHN C. CUTTER, M.D.,
Sapporo, Japan, 1884.

in accounting for the honors thrust upon him abroad."

One of his peculiarities was that he never turned the conversation on himself, so that very few knew the facts of his career. To a few intimate friends only would he allude to his travels or life in the Orient. After his mother's death in 1893, he gave up his practice and spent the following winter in Mexico and California. In fact (for the next three years) he traveled most of the time in the United States. He said he had been in every state and every territory but one in the Union. He was very fond of travel and said a train of cars had a peculiar fascination for him. In 1897 he received a shock, which left him with partial paralysis. It also affected his eyesight and memory. Several winters during his illness he spent with Dr. Robert I. Edes, in Boston. Although an invalid, he retained his interest in affairs of the world. He was particularly anxious to have us read to him the happenings in the medical world.

He did not remember what took place from day to day, but still could talk intelligently on most subjects. It seemed sad to see him, with a bright outlook and much good work planned, in such a condition, stricken in the prime of life. He was very patient, and never complained. When anyone alluded to his trouble, he would reply, "It is all right, it was to be. It had better be I than the other man, who has a wife and children. I have neither." He died February 2, 1909, of cerebral hemorrhage, after twelve years' illness.

He was straight and honest in all his dealings and wished others to be the same.

When his father died, he left debts to the amount of several thousands, all of which the doctor, with his mother's help, paid dollar for dollar, also the interest. When asked by one of his classmates why he did it, he replied, "I do not care to have people say, 'Oh! he got his education—and his father's debts not paid.' I'll have a clear conscience."

In his will he left the old home and land to the town of Warren for a children's playground, which was the first bequest of its kind, so far as is known, in this part of the country; to the Library Association, his books and some of the curios he had collected in the Orient, also his decoration from the Emperor of Japan, which he valued the most of all his many gifts that he received while professor in the Agricultural College at Sapporo, Japan.

His surgical instruments and his microscope were left to the City Hospital, Boston, Massachusetts. A sum of money, 1000 Japanese silver yens, equivalent to $500, was given to the college at Sapporo, Japan, for a drinking fountain, suitably inscribed, to be placed on the college grounds; the income of $1000 to the Agricultural College in Amherst, Massachusetts, to purchase books on hygiene.

To the Loyal Legion, Boston—curios of John Brown times.

After a few other bequests to relatives and friends, the residue of the estate was left to Harvard Medical School.

The remarkable scope of the testator's ideas is shown in the use assigned to the income of the property. It is a fund for maintaining a Cutter Lectureship on Preventive Medicine, one of the first bequests for such a purpose; these lectures to be free to all medical men, and to representatives of the press.

As specified in the will, the following inscription has been chiseled on the family monument in Pine Grove Cemetery, Warren, Massachusetts.

"JOHN CLARENCE CUTTER, B.Sc., M.D.
Meiji IV Japan
July 10, 1851
February 2, 1909"

In closing this sketch of Dr. Cutter's life, there are two incidents which may reveal a little of his character.

As he was consulting physician and surgeon to the Imperial Government, he was not allowed to take fees, but could accept presents, and many of his rare curios were gifts from grateful patients. One of these is a rare specimen of ancient porcelain, which the owner, an old man, gave as the most valued of all his possessions. A bit of amusing history is connected with this gift. The old man had a young wife, who, as the doctor thought, preferred to have her spouse called to a higher life. The doctor set himself

to work to cure the old man who was so pleased that he gave him the ancient porcelain. While in Japan, the railroad from Otaru to Sapporo was built. Soon after it was completed, the doctor had occasion to take the train to go to a town, a short distance down the line. When out a few miles, the engine jumped the track. The Japanese did not know what to do. The doctor, who watched them in their efforts, finally asked for jack-screws and described them. They were found, and with his assistance, and directions to the Japanese, the engine was back on the track. They looked at him in amazement, and asked, "Do all the men in America know how to do everything?" He told them that most boys where he lived were taught many things, but not everything. The engine was very small compared with those in this country even at that time.

But the incident illustrates the resourcefulness of the man, which helped to win for him the admiration and confidence of those about him.

Clinical Department.

SYPHILIS OF THE LUNGS.*

BY NATHANIEL K. WOOD, M.D., BOSTON.

THE finding of extensive dulness of the lungs during routine examinations in cases that did not show tubercle bacilli in the sputum has interested me to collect data that would point to some other cause than tuberculosis for such dulness.

At the same time the recognition of the Spirocheta pallida and the discovery of the Wassermann test have proved pathological findings, not heretofore recognized as such, a manifestation of syphilis. A striking example of what I mean is aortitis. Therefore, the question suggests itself. can the prevalence of lung dulness be correlated with the prevalence of syphilis? Can sufficient evidence be found clinically to justify a diagnosis of syphilis of the lungs? Is that evidence of sufficient weight to convince the pathologist that he is overlooking something, or calling something already seen by a wrong name?

From twenty-two cases, I have selected a series with histories suggestive of syphilis, whose physical examination showed definite lung impairment. If the Wassermann test proved positive, I had sputum examinations made and von Pirquet tests tried. If these proved negative, I had radiographs taken of the chest and long bones of the lower leg. I was able to select seven cases that showed definite histories, definite lung impairment, positive Wassermanns, negative sputum and von Pirquet tests. To these were added four cases which did not meet the above requirements. One had a few tubercle bacilli in the sputum, Gaffky No. 2, but had in addition a markedly positive Wassermann test and definite radiographic findings. The three others were children, upon whom the diagnosis of tuberculosis had been made and who had been carefully treated for tuberculosis several years. Repeated examinations of their sputum have shown no tubercle bacilli, but their family histories were strongly suggestive of syphilis. No Wassermann tests or radiographs were made upon them, but I wish to cite them because of the marked effect which mixed treatment had upon them.

CASE 1. W. J., Male. January 29, 1915.

F. H. Could not be obtained.

P. H. Gonorrhea twice. Hard chancre.

P. I. Pains in abdomen. Cough and expectoration. Constipation.

P. E. W. d. & n. Skin negative. M.M. pale. Teeth bad. General glandular enlargement.

Lungs. Marked dulness in upper 2/3 and moderate dulness lower third, in front. Rare crackles left top. In back, few medium crackles above the spine scapula. Harsh respiration from the apex to the angle of scapula. Right back, diminished respiration upper half with few dry râles. Fairly good respiration lower half.

Heart. Not enlarged. Action regular. First sounds weak. No murmurs. P^2 plus.

Liver. Edge felt 1½ cm. below costal margin. Old scar of the penis.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Clavicles, lower ribs and tibiae show periosteitis and endosteitis.

Chest. Aortitis. Infiltration lower third right lung.

Weight. 125 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

July 31, 1915. Has had a good month. No pain in abdomen for six weeks. No cough. Bowels move well. Eats and sleeps well.

Weight. 132½ pounds.

Lungs. Dulness in front remains the same. Respiration distinct. Fair excursion. Rare dry râles at apex left side. In back, dulness has decreased on the right side. Respiration is heard easily, excursion good, no râles. On left, broncho-vesicular upper half. Good lower half. Few dry râles, upper half.

February, 1916. Has improved since laste note. Weight, 135.

CASE 2. C. M., female, 55 years old. Single. March 19, 1915.

F. H. Father and mother died when she was very young. Six brothers or sisters died before one year old.

P. H. Heart and kidney trouble 7 years.

P. I. Loss of appetite and strength, pains in joints, headaches, constipation, chronic cough with expectoration and shortness of breath. Poor memory.

P. E. W. D., p. n. Skin pale. M. M. pale. Teeth poor. General glandular enlargement. Chest small and flat. Clavicles and ribs prominent.

Lungs. Marked dulness both lungs throughout,

* Read before the American Climatological and Clinical Association at Washington, D. C., May 11, 1916.

right more than left. Bases filled with moist râles. Musical râles the upper half. Respiration faint over upper half. Poor excursion throughout.

Heart. Right border 4 cm. to right of mid-sternal line. Left border, 13 cm. to left of mid-sternal line. Action very irregular, sounds faint, no murmurs.

Liver. Felt 2 cm. below costal margin. Oedema of ankles.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Both fibulae show periosteitis. Chest, very large heart.

Weight. 157¼ pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

March 25, 1915. Feels very much better. Very little cough. No oedema of ankles. Less headache.

Lungs. Few medium dry squeaks scattered over entire right and rare dry râles over left.

February 5, 1916. Slow and steady improvement. Looks and feels decidedly better.

Weight. 168. Memory improved.

Lungs. Few rare, sonorous râles in upper half of both fronts and over the entire back. Dulness the same.

Heart. Slightly irregular. A short presystolic murmur has developed.

CASE 3. W. P., male, 35 years old. Married. February 23, 1915.

F. H. Father died of tuberculosis. Mother alive and well. Two sisters died as babies. Four brothers and one sister alive and well.

P. H. "Brain fever" at age of 13. Rheumatism twice, last time 8 years ago. Several quinsy sore throats. Has two children, both poorly developed and poorly nourished. Has lost no children.

P. I. Ten weeks ago spat up one-half cup of blood. Blood streaked sputum for next three days. No more blood until three days ago. Since then blood streaked sputum. Cough for one month before first hemoptysis, then none until five days ago. Best previous weight 141, 16 years ago.

P. E. F. d. & p. n. Skin pale. M. M. pale. Teeth poor. Glandular enlargement marked. Chest narrow. Clavicles prominent.

Lungs. Marked dulness upper two-thirds of both lungs in front. Broncho-vesicular respiration right top. No râles in front. Marked dulness both backs throughout. Broncho-vesicular respiration upper half. Diminished respiration lower half. Few medium crackling râles left back from angle of scapula to base.

Heart. Right border right edge of sternum. Left border, nipple line.

Liver. Not felt.

Sputum. Negative.

Von Pirquet. Positive

Wassermann. Plus plus.

Radiographic Findings. Clavicles, three lower ribs, tibiae show periosteitis and endosteitis.

Chest. Infiltration both apices.

Weight. 127 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

March 6, 1915. Tubercle bacilli found in sputum, Gaffky No. 2.

Weight. 126½ pounds.

Treatment. Idem. Patient allowed to continue at work.

April 14, 1915. No tubercle bacilli found in sputum. Feeling very good. No blood streaked sputum since February 26, 1915. Coughs much less and raises only in the morning.

Weight. 132 pounds.

April 28, 1915. Feeling very well. Coughs rarely and only when he has to raise sputum. Raises less than one drachm in 24 hours.

Weight. 136½ pounds.

Lungs. Dulness upper half both lungs in front. Good respiration. Few to rare, fine and medium stretching sounds both bases. In back, dulness persists. Diminished respiration lower two-thirds on left. Rare medium, stretching sounds at base. On right, diminished respiration lower half, fairly deep respiration, rare stretching sounds scattered all over back.

Sputum. No tubercle bacilli found in sputum.

June 9, 1915. Says he feels as well as he ever did in his life. No cough, no expectoration.

Lungs. Respiration good. Excursion good. No râles heard.

Weight. 141 pounds.

August 3, 1915. Weight 143. Slight cough in the morning.

February 3, 1916. Has taken no medicine since August. Has felt well until the last few weeks. Now has choked up feeling in chest. Is coughing and raising.

Weight. 133 pounds.

Lungs. Marked diminution of dulness throughout both lungs. Front right apex rare fine crackle. Rare dry râles left apex. Good respiration. Good excursion. Back, diminished respiration left top. Rare, fine and medium stretching sounds upper half. Rare, fine and medium stretching sounds with cough to mid-scapula on right. Good respiration and good excursion entire right side.

Treatment. Resumed mixed treatment.

March 9, 1916. Weight, 136 pounds. Choked up feeling has disappeared. Cough and raises rarely.

CASE 4. M. C., female, 35 years old, married. March 10, 1915.

F. H. Father and mother living. Two brothers and five sisters living. Three brothers died in infancy before two years old.

P. H. Has had seven children. Three have died, one with diphtheria, two mal-nutrition, ages four and five months respectively.

P. I. Past four weeks headache and nausea. Poor appetite. Fatigue. Very constipated. Best weight 112, 15 years ago.

P. E. P. d. & n. pale. M. M. pale. Teeth bad. General glandular enlargement. Chest small. Clavicles prominent.

Lungs. Marked dulness throughout both chests. Faint respiration. Limited in excursion. Whispered voice plus over the right upper lobe. Rare, dry squeaks right mid back.

Heart. Right border mid-sternal line. Left border one finger breadth inside nipple line. Sounds weak at the base. No murmurs. P^2 plus.

Liver. Not felt.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Bones show nothing. Chest shows nothing.

Weight. 85 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

June 30, 1915. Weight, 88 pounds. General condition much improved. Pale and under weight.

Lungs. Dulness persists in lungs. Respiration fairly good in front. Diminished in back. Excursion good in front and fair in back. No râles.

March 14, 1915. From December 4, 1915, to January 27, 1916, was given injections succinamide of mercury, gr. one-fifth. Since then has felt very well.

Weight. 94 pounds.

Lungs. Continue to show dulness, but good respiration.

CASE 5. E. W., female, 36 years old, married. April 8, 1915.

F. H. Negative.

P. H. Asthma and bronchitis several years.

P. I. Cough all winter. Poor appetite. Loss of 10 pounds last few months.

P. E. F. D., f. n. M. M. pale. No glandular enlargement. Chest barrel-shaped.

Lungs. Marked dulness throughout both, especially upper two-thirds. Harsh respiration throughout. Some to few, medium and coarse wheezing râles over entire chest, front more than back.

Heart. Cardiac area normal. No murmurs.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Bones show nothing. Chest shows nothing.

Weight. 107 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

July 30, 1915. Temp. 99.2. Weight, 112¾ pounds. Feels very much better. No cough. Has raised nothing for eight weeks.

Lungs. Much less dulness. Right front few, fine and medium squeaking râles with cough, scattered over entire side. On left, rare, fine and medium, dry squeaks with cough scattered over upper half. In back, few fine, medium and coarse squeaking râles with cough scattered over both sides, top more than base.

September 2, 1915. Weight, 119¼ pounds. Feels very well. No subjective symptoms referred to chest.

Lungs. Clear throughout.

CASE 6. G. A., male, 22 years old, single. Mar. 26, 1915.

F. H. Negative.

P. H. Severe pneumonia in childhood affecting left side. Gonorrhea and chancre.

P. I. Bad cough for two months. Feels weak. Has lost 10 pounds in two months. Occasional night sweat. Raises thick, yellow sputum.

P. E. W. D. & N. Good teeth. General glandular enlargement. Chest, good size.

Lungs. Very marked dulness over entire left side and marked dulness upper two-thirds of right. Moderate dulness lower third. Faint respiration over left side. Râles scattered throughout left.

Heart. Right border mid-sternal line. Left border not determined.

Liver. Edge felt. Is tender.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Plus plus.

Radiographic Findings. Periosteitis of bones suggested. Chronic pleuritis of left lung.

Weight. 122 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

May 25, 1916. Has improved but little. Feels weak and tired. Pain in the left axillary region.

Lungs. Dulness persists. Good respiration on right side. Few to rare, fine clicks scattered over lower half. Left front, bronchial respiration fourth space. Some to few, fine and medium, sticky râles or pleuritic rubs with cough. Left back, few, fine, medium sticky râles with cough to spine. Some fine, medium and coarse friction rubs from spine to angle. Few fine and medium, pleuritic rubs from angle to base.

April 13, 1916. Has taken treatment regularly. Wassermann test negative. Weight, 142 pounds. General condition excellent. No cough. No expectoration.

Lungs. Marked dulness persists over left. Some dulness on right. From above downward on left, few, some to considerable fine, medium and coarse friction rubs front and back. Few, fine friction rubs at base of the right.

CASE 7. C. S., female, 52 years old, married. October 1, 1914.

F. H. Husband died, shock, age of 63.

P. H. Has had six children. One died at three months, one at five months, one at one and one-half years old. The latter, however, of diphtheria. Dizziness and headaches occurred at three or four days' intervals for several years.

P. I. Increasing attacks of the above. Dizziness is more severe and lasts longer.

P. E. W. d. & f. n. Glandular enlargement. Poor teeth. Chest small. Clavicles prominent.

Lungs. Show slight dulness upper half and front and marked dulness from the spine to the angle of scapula both backs. Rare, dry râles left back.

Heart. Right border, right edge of the sternum. Left border, nipple line. Loud systolic murmur at apex transmitted to axilla.

Liver. Edge felt.

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Periosteitis and endosteitis of the tibia. Chest, aortitis.

Weight. 135 pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

June 21, 1915. Feels very much better. Very little headache. No dizziness. Sleeps well. Weight, 146½ pounds. Chest examination practically the same.

July 26, 1915. Has taken no medicine for four weeks. Feels well. Weight has dropped, however, to 140½ pounds.

Lungs. Clear throughout. Good respiration. Good excursion.

January 21, 1916. Has taken medicine irregularly. Feels rather poorly. Weight, 140 pounds.

May 1, 1916. Has taken medicine regularly last two months. Weight, 142¾ pounds. Feels very much better. Lungs perfectly clear.

CASE 8. M. G., female, 37 years old, married, colored. April 22, 1915.

F. H. Negative.

P. H. Two children. Two miscarriages.

P. I. Twelve years' pain in left lower quadrant. Worse on exertion and when constipated. Loss of 12 pounds in last five months. Slight cough and expectoration.

P. E. W. D. & W. N. Teeth bad. No glandular enlargement.

Lungs. Moderate dulness upper two-thirds of both. Good respiration. Good excursion. Few scattered râles right back.

Heart. Right border, right edge of sternum. Left border, nipple line. Systolic murmur over the right side of the heart at apex, not transmitted to axilla.

Abdomen. Tenderness lower left quadrant. Tube?

Sputum. Negative.

Von Pirquet. Negative.

Wassermann. Positive.

Radiographic Findings. Tibiae suggestive. Aorta suggestive. Heart very large.

Weight. 167¼ pounds.

Treatment. Tr. nux and gentian before meals. Mercury and potassium iodide after meals.

May 27, 1915. Has had occasional night sweats. Does not cough. Raises nothing. Sleeps poorly. Lungs show good respiration. Good excursion. No râles.

July 24, 1915. Weight, 170 pounds. Feels much better. Says she has some pain in her chest, but says that her respiration is deeper than formerly.

Lungs. Rare stretching sounds over lower half of back.

February 24, 1916. Has done well all winter.

Weight. 174 pounds.

Lungs. Show good excursion, good respiration. Scattered stretching sounds.

CASE 9. L. A., boy, 10 years old. December, 1911.

F. H. Father and mother alive and well. Mother has had two miscarriages. Father, dissolute.

P. H. Age of 6 months was dropped. At age of 10 months developed abscess of the right hip, resulting in ankylosis of hip joint.

P. I. Very weak. Cough and expectoration. Discharging ear. Inflammation of the eyes. Poor appetite.

P. E. Has marked Hutchinsonian teeth, as have one brother and one sister. P. D., emaciated, very pale. Marked glandular enlargement.

Lungs. Marked dulness. Râles and poor respiration.

Weight. 46½ pounds, stripped.

June 12, 1913. For a year and a half has had careful anti-tuberculosis treatment. In that time he has gained 11 pounds. Physical signs have improved decidedly. Mixed treatment started on this date.

December 19, 1914. This last year and a half the patient has gained 15 pounds. The improvement has been very marked. Much less lung involvement.

Sputum. Repeated examinations of sputum have failed to find tubercle bacilli.

CASE 10. C. B., little girl, 11 years old. February, 1913.

F. H. Mother a drinking woman who was deserted by a drinking husband. Adopted at age of 6 months.

P. H. Constantly ill. Frequent colds. Digestive upsets. Never able to go to school. Eczema of nostrils, corners of mouth and back of ears.

P. I. Referred to me after one and one-half years of treatment for tuberculosis in a public institution.

P. E. Showed extensive involvement of the lungs and a poorly developed and emaciated child. A careful record of temperature showed daily temperatures of from 100 to 101.5 for a period of four months. Weight, 65½ pounds.

January 8, 1914. After 11 months' rigid anti-tuberculosis treatment. This child was still very weak, showed marked trouble of the lungs and weighed only 65¼ pounds. Mixed treatment started on this date.

January 7, 1916. Marked and rapid improvement during entire year. In October the child was able to go to school for the first time in her life and has missed only two days of school.

Lungs. Showed marked improvement.

Weight. 78½ pounds, a gain of 13¼ pounds.

Sputum. Repeated examinations of sputum have failed to find tubercle bacilli.

CASE 11. G. P., small boy, 9 years old. December 9, 1909.

F. H. One uncle and one brother epilepsy.

P. E. Marked Hutchinsonian teeth. Marked lung involvement.

June 19, 1913. After three and one-half years' treatment, this boy gained 20 pounds. Condition of lungs has shown no improvement during the past year. Mixed treatment started on this date.

October 4, 1915. Two and one-third years later this boy has gained 24½ pounds. The improvement of the lungs has been as marked as his improvement in general condition. No tubercle bacilli have ever been found in his sputum.

No Wassermann tests or x-ray examinations have ever been made on these last three cases.

DISCUSSION OF FINDINGS.

There is strong evidence of syphilis in these individuals; previous history of sickly children, born into families where there has been a series of miscarriages, dead-born children and early infant deaths; subsequent history of chancre, or loss at early age of their own children; physical signs of general glandular enlargement, Hutchinsonian or badly decayed teeth, scars and skin eruptions; positive Wassermann tests; radiographic findings very positive in three cases, suggestive in three others of syphilitic bone lesion and circulatory lesions. There is equally strong evidence of disease of the lung; marked dulness throughout both chests; poor respiration, limited excursion; varying numbers of moist and dry râles confined more to the bases than the apices of the lungs; history of cough and expectoration. The following evidences of disease were found by the radiograph: periosteitis of the tibiae, fibulae, clavicles and ribs; marked broadening of the arch of the aorta; enlarged heart; infiltration of the lung tissue; pleuritic thickening. Definite involvement of bones, aorta and lungs was found in three cases; suggestive involvement of the bones was found in three others, one of the latter showing an enlarged heart and broadened aorta, another an enlarged heart and another pleuritic thickening.

These cases have been under treatment about one year. They have observed simple hygienic rules such as early hours, good food, three meals

a day, re-enforced by two luncheons. In addition they have had Tr. nux and gentian before meals and mixed treatment after meals. One had injections of mercury for five months. All but one has worked steadily. The results of treatment have been small gains in weight, 3 to 16 pounds, great improvement in general physical condition, marked diminution of tendency to take cold, and improvement in chest findings such as disappearance of râles, deeper and steadier respiration and diminishing of dulness. In the one case in which tubercle bacilli were found, no tubercle bacilli could be found subsequent to six weeks of mixed treatment. When this individual stopped mixed treatment, he gradually lost ground, which was regained at once upon the resumption of mixed treatment. Of the three children, one gained in the first 1½ years of treatment 11 pounds, then the only change in treatment was the addition of mercury and potassium iodide. In the next 1½ years he gained 15 pounds and the lungs showed a corresponding improvement. Another lost, after one year of treatment, ¼ pound, then mercury and potassium iodide were started. At the end of nine months she had improved so much that she was able to go to school for the first time in her life, and when the year was completed she had gained 13 pounds in weight. The third was under treatment for three and a half years before mercury was given. During that period he gained slowly, the lung condition cleared up very slowly and his weight increased only 20 pounds. After the mercury was started, in 1¼ years' less time he gained 4½ pounds more, or 24½ pounds. His lungs, which had shown no improvement for a year, showed marked diminution in dulness, marked increase in respiratory excursion and all râles disappeared. In addition to these marked gains in weight, these children have grown from three to five inches taller since the mercury was started.

EVIDENCE, IF ANY, OF SYPHILIS OF THE LUNGS.

We must first establish the fact that there has been disease of the lung in these cases. This is proved by the respiratory symptoms, such as cough and expectoration, tendency towards frequent colds, poorly developed chests, poor expansion, marked dulness and râles varying from few to some and from dry to moist. The radiographs show infiltration in two of the lungs and pleuritic thickening in another. These conditions occurred in individuals where the only signs pointing toward tuberculosis were the physical findings of the chest examination. Family exposure to tuberculosis is lacking, no tubercle bacilli were found in the sputum and von Pirquet tests were negative. On the other hand there is good evidence to point to syphilis in other parts of the bodies, at least of these people. The family and personal history conforms to that diagnosis, the physical examination is in favor of it, the Wassermann test is positive in contrast to a negative von Pirquet. In three cases the long bones show definite syphilitic lesions and in three others suggestive lesions.

Finally, the evidence of treatment favors the diagnosis of syphilis. These patients were allowed to work, they did not attempt to live or sleep out of doors, but were given instead tonic treatment together with anti-syphilitic treatment. That they made definite improvement is very certain, that they retrograded when they stopped treatment is equally certain. In the cases of the three children, the improvement in condition, after long and most careful anti-tuberculosis treatment, was most marked, and can scarcely be called a coincidence or one that was bound to follow because the tuberculosis was being cured. This improvement was much the longest delayed in that case from which the mercurial treatment was withheld the longest. This improvement under mixed treatment has not taken place solely in the general condition. The local condition of the lungs has improved. Shortness of breath has diminished, asthmatic attacks have disappeared, tendency to take cold has ceased, respiration has become deeper, clearer, râles have dried up and finally the amount of dulness has lessened.

CONCLUSIONS.

We have, therefore, cases showing definite lung lesions in persons who lack two definite laboratory signs of tuberculosis, positive sputum and von Pirquet tests, and who give no history of contact with tuberculosis. These persons, on the other hand, react positively to the Wassermann test, have definite family history of syphilis, show syphilitic lesions elsewhere in the body, and respond rapidly to syphilitic treatment. Most important, the local condition of the lungs improves as definitely under syphilitic treatment as does the general condition.

To me, however, the evidence which I have tried to secure is far from conclusive. Too often tubercle bacilli cannot be demonstrated in the sputum of patients who have later been proved to have tuberculosis. The number of cases which I could collect have been too few, the difficulties of controlling them too great; and the lack of radiographic confirmation of demonstrable lesions in the lungs, themselves, leaves us with result of treatment as the strongest link in our chain. This is far too weak a link to overthrow the strong evidence of the pathologist that syphilis of the lungs is very rare.

I realize fully that if there is such a thing as syphilis of the lungs it must be demonstrated on the autopsy table. If, however, the facts of medical treatment and clinical observation continue to point toward such an infection of the lungs, as I believe they will, greater efforts must be made to find pathological corroboration.

CONTROL OF SCARLET FEVER.

BY D. M. LEWIS, M.D., NEW HAVEN, CONN.,

Epidemiologist, Board of Health.

FROM lack of epidemiological observations on sporadic or endemic cases, the control of this disease is as yet limited to the search for missed cases and the supervision of reported ones. I wish to show that it is possible to demonstrate the carriers of this disease, who, as responsible for the missed as well as the reported cases, are, consequently, the basis for the control of scarlet fever.

The following two cases are illustrative of the type of carriers which are now being recognized rather generally as those who give rise to recurrent cases.

CASE 1. Females, ages 2 and 3, sisters, were reported March 11, 1914. A third sister, age 14, was on that date sent from the house. The reported cases were ready for release and fumigation at the expiration of four weeks. The child aged 2 showed at this time an unfaded tongue, the so-called strawberry tongue, and an edematous, hyperemic throat as contrasted with the sister age 3, whose mucous membranes were quite normal. Though warned as to the danger of further contact with the first mentioned child, the family paid attention only to the fumigation of the entire house that the sister of 14 might be immediately returned to the home. One week later this sister in turn was a reported case. The younger sisters at this time showed the same signs as on their release one week previous. At the time of release of the last reported case, the mucous membranes of all three were normal. During and following this period there were no further neighborhood cases.

CASE 2. A male, age 14, was reported March 9, 1914. Released without inspection at the expiration of one month, the entire house was fumigated for safety for expected company. Within a week the visitor and a friend were both reported cases. The first case at this time showed the characteristic tongue, a markedly edmatous throat and an acute rhinitis. With his isolation for some three weeks until the membranes were normal, there were no further cases until November of the same year when a chum of this case was reported with the disease. Again looked up, this boy was found to be again showing a very typical strawberry tongue and a subacute naso-pharyngitis. With his isolation for some two weeks when his membranes had become normal, there were no further cases in the neighborhood for the season.

The following case is similar to the preceding though given as illustrative of how the disease may start up in the fall.

CASE 3. Male, age 5, was reported November 2, 1914. Released at expiration of six weeks with discharging ears and purulent nasal discharge. During following two months there were four neighborhood cases in children of the same age. On August 2, 1915, while seeking diphtheria carriers among some nursery children at their shore cottage, I saw a boy being admitted who had an ear filled with cotton, a purulent nasal discharge, a marked streptococcus sore throat, a strawberry tongue and a temperature of 102. I asked the matron of the institution to isolate this child until they could learn his home address as he was undoubtedly a case of scarlet fever. The following day I was informed that he was the child described as a case of November, 1914. Without ensuing rash or desquamation, it was only after six weeks' treatment that the nasal discharge was cured and the tongue faded. Through the entire season there has been no case of scarlet fever in this boy's neighborhood, nor has he again stirred up the naso-pharyngeal recurrence of the summer.

The following cases represent types of carriers not yet recognized either by health authorities or by physicians.

CASE 4. Three children, ages 7, 9, and 10, had scarlet fever in March, 1915. As absentees from school in mid November of that year, they were looked up and the following conditions were found. The youngest had had nasal hemorrhages and a purulent nasal discharge for the past four weeks. The other two had had sore throats. All three had characteristic strawberry tongues and inflamed pharynges. All had been treated for malaria and confined to the premises with one exception. The youngest child had played with a new arrival in the neighborhood on one occasion when he had been left alone. A week later this new arrival was a reported case of scarlet fever. This fact was learned at the time of release of the reported case. At the time of beginning quarantine, the mother had been certain that there had been no contact with any neighborhood children, even to her child never having been out of the yard. Later from a neighbor she had learned the fact mentioned.

CASE 5. A female, age 10, had had scarlet fever 4 years previously. A brother age 6, as a school absentee, on examination, showed a throat and tongue suspicious of a recent mild scarlet fever. Onset had been attended by vomiting and fever. The sister mentioned also showed the strawberry tongue and a subacute throat. An older sister who also had had scarlet fever four years previously, showed no signs. The present history was that first the girl, then the boy had been sick with malaria. My records showed that at this time I had two cases referable as to age, sex and school, with these two children, and reported some two weeks after their onset of "malaria." Both boys were in a neighboring school; both girls in a remote one. Both sets were playmates.

CASE 6. Male, age 7, had scarlet fever two years previously. Seen in November, 1915, as a school absentee, he presented, according to his physician, all the signs of scarlet fever except the rash. The onset was with vomiting and high temperature. Had he not attended the boy previously for scarlet fever, the physician stated that he would have at this time reported him as a case. Only after three weeks' isolation did the mucous membrane, become normal.

CASE 7. A female, age 12, had had scarlet fever school absentee, this girl showed a recurrent otitis

media and a recent sore throat. The tongue was a fairly typical strawberry type. Out of school but not house confined, this case accounted for two cases of girl chums reported March 16, and an older brother reported on March 20. The records showed that she probably accounted for some six neighborhood cases in girls, two of whom were in another family in the house, during the preceding year at a time that we now learned that she had had a similar disturbance.

CASE 8. A female, age 20, was sent to the isolation hospital as a case of diphtheria. A culture sent me by the physician showed a pure streptococcus. The hospital stated that they would entertain my diagnosis of scarlet fever from the very characteristic tongue and throat. At the end of one week, failing to find any eruption or desquamation, and finding that the patient had had the disease 10 years previously, on her request she was discharged. Attempting to obtain the history of any infective periods during the ten year period, I found that a sore throat of the previous year corresponding to a period when scarlet fever was beginning to appear in a corset factory only to shift to a munition factory. The three cases in the first factory were in girls, those in the latter were among men. Some few days after her sore throat had commenced, this girl had left the corset factory and began work in the munition factory. A week later began a long series of cases among men in two different machine shops and a few of the central office force. At that time, I had found that the only common communication was through a force of girls who handed out and received back machine tools for these men from behind a counter. The central office force also had contact with these girls. Numbering upwards of 100, I had asked the factory sanitarian to examine this set of girls for strawberry tongues and red throats. The following day he reported that he had found none. I now had the data that she had been one of this set of girls. Further past history was refused when I pointedly asked as to the disease having been present in houses where she had lived, although a friend who was present remarked on the fact that once when she had had one of her sore throats, a girl in the house had later had scarlet fever. This case represents the longest time interval after having had the disease of showing the signs of a carrier that I have yet seen. The buccal-pharyngeal signs even after the now ten days' illness were the most marked that I have yet seen. The basis for this was apparently an extraordinary lymphoid hypertrophy of the naso-pharynx.

Proving of carriers. That those individuals who have at the end of convalescence ear or gland discharges, may be carriers needs at the present time no proof. That those who have had the disease previously may be carriers can be proven under the same conditions as the former. The one essential is that both groups shall show some grade of buccal-pharyngeal inflammation as shall be characteristic of primary scarlet fever. With the subsidence of this factor in the first group and its absence in the second group, I do not find individuals infective. That both groups are infective during its presence, is demonstrable by the recurrent cases in the family if the first group is then in contact with susceptibles, and by the absence of further cases in the family or friends when the second group is isolated. With the finding of carriers of the second group when they are confined to bed, I have found that a single exposed individual in the family may develop the disease. Otherwise, and especially where there are no other children in the family, I have found that I have had neighborhoods where such individuals have been found in the early fall, isolated for the three and even longer weeks of the tongue and throat inflammation, and the entire season passed with no cases of the disease appearing. Again, where these individuals have been found after there has been one or more cases of generally, the same sex, age and factor of being playmates, there will be no further cases when that individual is isolated. In one instance where the individual could not be controlled there was a later case. A further factor of proof is that in doing neighborhood survey work, I have seen these carriers, previously showing positive signs and apparently accounting for reported cases, later have sore throats without positive signs, be permitted their freedom of contact and not have cases of scarlet fever follow.

Results. During the first four months of epidemiological work, the usual régime of quarantine and terminal fumigation then holding, I had 4 recurrent cases in a total of 198 cases. During the following two years with approximately 500 cases, I had but 1 recurrent case. That was an instance where from necessity the quarantine had to be removed and only the convalescent carrier isolated. Unknown to me, one of the children of the family who had been a hospital resident for four months was then returned to the home and in one week was a reported case. During the first year of simple isolation of the one sick with inspection to prevent convalescent carriers, doing away with fumigation, I prevented secondary as well as return cases. This in spite of the fact that less than 10% of the cases were hospitalized. During the second year with the added factor of finding of the carriers who had previously had the disease, I have had a lessened number of reported cases. Of yet greater importance is the result from the simplified procedure of quarantine based on my results in diphtheria, which disease has been made infrequent in incidence compared to all previous years and with reference to other cities of this state for this year. Based on the frequency with which I could demonstrate carriers who had had the disease either in the family, in other families in the house or neighborhood, the procedure is as follows: Immediately after inspection at the time of quarantine, all school children in the same house, but outside the family, are returned to school from that residence. All children in the family concerned are returned if they will live and board with another family in the house or neighborhood. Any carrier in the family, house or neighborhood, was isolated, though given rear yard freedom during school

hours, if under supervision, and there were no children to gain access to the yard. All adults were allowed to live at home irrespective of occupation. Inspection of adults was insisted on only when there was a history of previous sore throats or the adult was a raw food handler. Of upwards of one thousand children and one half that number of adults returned to school and work respectively, at the time of instituting quarantine, I have had but two instances of secondary cases in the family, house or neighborhood when the carrier was found. One was in a child who contracted the disease three weeks after she was returned to school from a remote neighborhood, the other was an adult who contracted it from his wife who in turn contracted it from taking charge of a case of the disease in the family. Otherwise, none of these individuals given their usual previous freedom of living have developed the disease. I have then the proof that the secondary cases so frequent previously were not due to being exposed by the one sick but by the carrier. In diphtheria, as well as scarlatina, it has been my experience that no matter how poor the isolation of the patient ill, irrespective of the ages of the other children in the family, none will get within reach of the one ill, all will flock on the other hand to the carrier. The latter's popularity may always be estimated by the number of cases he causes.

Finding of carriers. As described in my article on the Control of Diphtheria, postal card notification of all school absentees, as well as those who are in school and have nasal or ear discharge, is the basis for finding carriers. A Visible Index of all previous cases with their addresses is also made use of when no carrier can be found in the house of a reported case.

Frequency of carriers. During the last four months of 1915, with some 39 reported cases of the disease, I have a record of 21 carriers found as well as 3 missed cases. During the first five months of 1916, with some 90 cases of the disease, I have a record of 10 carriers and 2 missed cases.

CONCLUSIONS.

I have practically abolished recurrent cases, made infrequent secondary cases, and lessened reported cases, by demonstration of the carriers of convalescence and the carriers previously having had the disease and by isolating these carriers.

Results of the so-called grading of quarantine does not depend on the quarantine, but upon the fact as to the presence of the carrier being within or without the family circle.

Full liberty may be safely given to all contacts who are free from the signs of the disease at the time of isolation of the one sick and the carrier.

Control of scarlet fever will be found to lie in the supervision of those who have previously had the disease, at and during those periods when with intercurrent infections they again show the buccal-pharyngeal signs of scarlet fever. Secondarily, missed cases and the convalescent reported cases are of equal importance.

Society Report.

BOSTON SURGICAL SOCIETY.

(*Incorporated.*)

TWELFTH MEETING.

A clinical meeting of the Society was held on Monday, April 3, 1916, at the Children's Hospital, at 10 A.M.

Cases were demonstrated by members of the staff of the Children's Hospital as follows:

I. Tuberculosis of the Metaphysis with Subsequent Extension Into the Epiphysis of the Femur. DR. LOVETT.

II. Apparatus devised as a combination of the Bradford frame and plaster, for the fixation and suspension of a child with fracture of the spine. DR. LOVETT.

III. A case recently operated upon for paralysis of the gluteus medius following poliomyelitis with a bad limp. The tendon of the vastus externus had been sutured with sixteen strands of No. 10 silk, four inches long, to the crest of the ilium. DR. LOVETT.

IV. A case for operation showing the application of a tag to the child's neck, in the ward, corresponding to the operation tag, so there would be no mistake in the operation on the side affected. This was a case of a child of nine years who had infantile paralysis at three years, with anterior tibial paralysis. A demonstration was made of the method of measuring the strength of the muscle pull of the affected muscle, and the peroneus longus was sutured in place of the paralyzed anterior tibial. DR. LOVETT.

V. A very severe case of infantile paralysis in a child with extraordinary deformity from contracture, showing the method of gradual straightening by plaster with wedges and tension straps.

VI. A demonstration of the relative methods of treating by traction and by abduction in fractures of the neck of the femur; illustrated by two cases—one of osteomyelitis, and one of congenital coxa vara. (In this case the mother also had a congenital coxa vara.) DR. LOVETT.

VII. DR. HARMER gave a talk on the treatment of naevus with liquid air and oxygen. He stated that it was not an effective treatment for the cavernous type, and showed two cases of excision of cavernous angioma of the neck.

VIII. DR. HARMER also gave a report on the study of ten cases of spina bifida which had entered the hospital since January 1st; average age, three days. All had meningoceles; all showed paralysis. One case showed a tumor the size of 5 cm. on the buttock, with prolapse of rectum and incontinence.

IX. DR. HARMER also showed a patient cut upon the wrist by a milk bottle. All flexor tendons divided with the exception of the thumb and the median nerve. Remarkably good result at five and

a half months after suture. No splint was used in this case, and motion was begun at once.

X. DR. LADD then demonstrated a case of harelip with wide separation of the intermaxillary bone. Age 10 months; operation 10 days before. Dr. Ladd demonstrated a clamp which he uses for guiding the cut in the lip margin, in order that both sides may be symmetrical.

XI. DR. STONE showed a case of Volkmann's contracture following fracture of the clavicle and bandaging of the arm, with sloughing and contracture. Dr. Stone detached the muscles from the internal condyle in order to permit lengthening, and had also done one abdominal plastic flap for contracture of the hand.

XII. DR. C. J. MIXTER showed a case of sarcoma of the bladder, operated upon by sub-peritoneal cystectomy, with closure of the fistula in about one month.

XIII. DR. MIXTER also demonstrated a patient with tuberculous peritonitis treated by injection of nitrogen.

XIV. Another case of tuberculous peritonitis was demonstrated in which the first laparotomy was followed by a re-accumulation of fluid, but the second operation with the use of nitrogen was followed by a satisfactory result.

XV. DR. MIXTER also showed a case for decapsulation for chronic nephritis.

XVI. DR. STONE showed a patient with gangrene of the scrotum resulting from infection of the umbilical cord in an infant, and spoke of other cases with extension to the peritoneum and the subcutaneous tissues of the thigh.

XVII. DR. LADD showed a case of imperforate anus in a child 24 hours old.

XVIII. DR. LOVETT showed a case of imperforate anus with recto-urethral fistula.

XIX. DR. LOVETT also showed a case of post-diphtheritic paralysis of obscure onset.

XX. DR. C. J. MIXTER then operated for tuberculous peritonitis by injection of nitrogen.

The meeting then adjourned.

(Signed) ROBERT B. GREENOUGH,
Secretary.

Massachusetts Medical Society.

DISCUSSION OF SYMPOSIUM ON GOITRE.*

DR. M. C. SMITH, Lynn: I wish to make a few remarks on this subject from the standpoint of the dentist. Hypothyroidism is today being recognized as a dental disease, and should be treated by the dentist. I do not think that there is any one symptom of insufficient thyroid secretion that is so thoroughly manifest as the condition in the mouth. The number of children that come to the dental clinics and to the office with irregular dentition, and with delayed and erratic dentition, and decayed teeth due to faulty metabolism of the thyroid, is becoming appalling, and something should be done to try to correct it before the teeth are erupted.

From the time of birth until the child is seven or eight we can tell almost the exact time when the child suffered most from the lack of thyroid secretion, and the fixation of lime salts in the teeth, and if the child suffered from lack of mineral salts in the teeth, it is reasonable to infer that the other bones also suffered.

In some children the benefit gained from the administration of thyroid is most marked, especially in cases of delayed dentition and in children bordering on cretinism. It has been my practice for some years to give thyroid to all children suffering with adenoids, enlarged tonsils, and to all cases of orthodontia. I never think of beginning to regulate the teeth of a young child without first giving thyroid, and I think the results justify the treatment.

DR. THEODORE C. JANEWAY, Baltimore: I want to express my very great interest in the various papers of the afternoon. I sat here quite fascinated by all that I have heard, and I want to congratulate the Society on such an admirable symposium.

There is one point which seems to me is reinforced by some results of the investigations which we have heard of this afternoon, and which we can all take to heart, even though we cannot ourselves apply the method of calorimetry. That is the very great significance of loss of weight as a symptom of hyperthyroidism. To any one who will pay attention to it, the effect upon the metabolism, which plays so important a part in the picture of the disease, can be detected early. I am quite sure that many patients are passed over merely because of the failure to recognize the significance of a continuing loss of weight, in spite of preserved appetite, and apparently for a time preserved energy and bodily activity. I have seen that symptom, when recognized, permit of successful medical treatment, in spite of the fact that I agree that, for the patients studied nowadays in hospitals, surgery is usually necessary. One of the reasons for the difference of opinion between surgeons and medical men is that we tend more and more to treat our patients in hospitals. We think in terms of the hospital population.

In hospital patients with exophthalmic goitre, as with most hospital patients with gastric ulcer, operation is a short cut to a cure. It is most desirable where the time consumed by protracted medical treatment of any kind is unlikely to be afforded. The patients will usually break off medical treatment before a sufficient period has elapsed. It is often the case that two years is necessary for the successful medical treatment of exophthalmic goitre. In private patients who can and will coöperate, however, the medical man may accomplish cures, and cures which are permanent, however; and Dr. Cannon's work is bringing more hope in that regard. Such patients must be carefully selected and still more carefully managed.

We must go back of the thyroid gland for the

*Continued from the issue of the JOURNAL for Oct. 19, 1916 (Vol. clxxv, page 569).

explanation. All the surgeon does—and of course it is a most important thing—is to break the vicious circle at its weakest point by the removal of the over-secreting gland, which is continually increasing the disturbance by its particular contribution.

One other point has interested me very much, and that is Dr. Boothby's statement about cases of myxedema. I have been very much impressed, in seeing mild cases of myxedema in consultation, with the frequency with which they are mistaken for chronic nephritis. Three things account for this,—the regular presence of albuminuria and hyaline casts, with low specific gravity of the urine, the edema of the lower extremities and the change in the color of the skin; also, in many cases, the occurrence of headache as a symptom, and the frequent moderate hypertension. I am not sure that I agree with Dr. Boothby that we may look on hypothyroidism as the cause of chronic nephritis, but I think, rather, that the diagnosis is wholly erroneous in some cases of chronic nephritis, and that the patient really has myxedema.

REPORT OF COMMITTEE ON WORKMAN'S COMPENSATION.

THE conditions under which the medical provisions of the Workman's Compensation Act have been operating in many of the industrial centres, have been more and more regarded by the physicians of the State as unsatisfactory. A belief that the injured employee was not getting in many places such medical services as were his due, has interested the profession sufficiently to create a strong demand that the State Homeopathic Society and the Massachusetts Medical Society investigate the matter and attempt to modify such conditions as seemed unfair. These investigations and the changes indicated by the results of the investigation will be under the direction of a Central Consolidated Committee. The nucleus of this committee is the Workman's Compensation Committee of the Massachusetts Medical Society, to which has been added a representative from each district society and, by invitation, three members of the Massachusetts Homeopathic Society (hereafter mentioned as the Workman's Compensation Committee.)

The events leading up to the formation of this committee and its personnel will be found in the issues of the JOURNAL for Sept. 28 and Oct. 19. There has also been considerable discussion of the subject in other issues of the JOURNAL, which, as the official organ of the Massachusetts Medical Society, places its columns at the disposal of all who desire to discuss important professional subjects.

The Workman's Compensation Act Committee has divided itself into sub-committees. The chairman of the Workman's Compensation Committee, and also of the sub-committee on legislation and finance, is Dr. A. N. Broughton of Jamaica Plain (Boston), and its secretary, Dr. J. A. Mehan, Lowell. Sub-committees on the following matters have been appointed. Legislature, Dr. Broughton, chairman; Finance, Dr. Broughton, chairman; Information and Statistics, Dr. Snow of Newburyport, chairman; Publicity, Dr. Mehan of Lowell, chairman. These appointments and addresses are given in detail because the members desire to receive all kinds of information and criticism which their fellow workers think useful to the cause, or to them personally. In many of the districts there are district committees organized to coöperate with the central committee, and it is desirable that each district society appoint such committees, and also each city medical club.

The Compensation Committee has held two meetings, and its sub-committees two. There is an agreement that much of the unsatisfactory working of the medical provisions of the law is due to the injured employee being obliged to accept the services of a physician employed by a commercial company, or forego the medical benefits of the act. That this has been regarded by the workers as detrimental to their best interests is evidenced by their organizations introducing and supporting in the legislature each year bills calling for an amendment of the act to give them freedom to employ the physicians in whom they have confidence. The workman is the important factor, and the careful attention which will make him as comfortable as possible and return him to work at the earliest possible day is, of course, his desire, and the desire of the medical profession. The knowledge that the physicians hired to care for him usually do so at a less rate than such services demand in the open market, does not increase his confidence in their efficiency. In this belief the physicians of the State (including the members of this committee) and the wage-earners are in complete accord.

The committee on statistics wishes all the information any of the readers of the JOURNAL can give on any of the phases of the working of this act and also upon any other subject affecting the practice of medicine.

With the letter from the chairman of this committee telling each physician in the State of this work, will be enclosed a blank asking in detail for the information the committee thinks most important at this time. It is hoped all physicians will give this matter of information the consideration it deserves. It is important now and may be increasingly so in future years. The success of this movement is so largely dependent upon the work of each physician in his own locality that the committee urge all to persistent action who believe, with the great majority of the profession, in these amendments.

Book Reviews.

A Practical Treatise on Infant Feeding and Allied Topics for Physicians and Students. By HARRY LOWENBURG, A.M., M.D., Assistant Professor of Pediatrics, Medico-Chirurgical College of Philadelphia. Illustrated with 64 Text Engravings and 30 Original Full-page Plates, 11 of which are in colors. Philadelphia: F. A. Davis Company. 1916.

The author, in this work upon infant feeding and allied topics, comes out very strongly in favor of breast-feeding. He shows that far more babies can be fed on the breast than now are, and that the unnecessary cessation of breast-feeding is the cause of many disturbances of digestion and not a few deaths. His directions for the modification of the breast milk are, however, hardly in accord with our present knowledge of the subject. His general discussion of "percentage" and "caloric" feeding is very satisfactory. In spite of this, however, he makes relatively little use of percentages in his methods of feeding and treatment. He advises the giving of skimmed milk mixtures in the beginning, gradually working to whole milk mixtures. He advocates the use of cane sugar as a routine measure. He shows his familiarity with the ideas of the German school of pediatricians, but in general follows the so-called American ideas. He differs especially from the German school in recognizing that protein, as well as fat and sugar, may cause disturbances of digestion. He emphasizes very strongly the importance of individualization and experience in the artificial feeding of infants, and in this connection advises the use of the term "adaptation" rather than that of modification of milk. He constantly emphasizes the importance of the examination of the stools in regulating the diet both in health and disease, and also recognizes the important part which bacteria play in the etiology of the disturbances of digestion. We regret that he recommends several of the proprietary foods in the treatment of diseased conditions in babies. We believe that it is unnecessary to use these foods, and that the same, or better, results can be obtained in other ways.

After discussing Feeding, he gives chapters on Infantile Atrophy, Rickets, Scurvy, Vomiting, Constipation, Diarrhea, Spasmophilia, The Exudative Diathesis and Pyloric Obstruction. It seems to us somewhat improper to treat of vomiting, constipation and diarrhea as if they were diseases, in the same way as rickets and scurvy. It would seem better to treat them as symptoms of the disturbances of digestion. He believes that spasm of the pylorus is the cause of hypertrophy, and states that clinically all cases of obstruction at the pylorus become operative when sufficient aliment fails to reach the intestines. This seems to us a very reasonable ground to take. The book closes with a chapter on special methods of treatment. There are many pictures, almost all of which are original and very good.

Painless Childbirth Eutocia and Nitrous Oxid-Oxygen Analgesia. By CARL HENRY DAVIS, M.D. Chicago: Forbes and Company. 1916.

The first part is a short review of the various attempts to make childbirth painless. In the second, the author gives some very pertinent facts on obstetric mortality and morbidity. The third part is taken up with the technic of the use of nitrous oxid-oxygen analgesia. The author is enthusiastic about nitrous oxid analgesia but his enthusiasm goes beyond bounds when he states "there is no logical reason why women should suffer during labor." The book is welcome because it stands out in such contrast to the unscientific books which have appeared during the past year about "twilight sleep" and painless childbirth. Although the reviewer cannot agree with all the conclusions and feels confident that later the author will at least modify some of them, the book is an excellent monograph on the subject.

A Guide to Gynecology in General Practice. By COMYNS BERKELEY, M.A., M.D., M.C. (Cantab.), F.R.C.P. (Lond.), and VICTOR BONNEY, M.S., M.D., B.Sc. (Lond.), F.R.C.S. (Eng.), M.R.C.P. (Lond.) London: Henry Frowde and Hodder and Stoughton. 1915.

Under the modest title of a Guide to Gynecology in General Practice, Berkeley and Bonney present an excellent book. It is written for the practitioner, but undergraduate students will find it valuable in their clinical training. Its purpose is to supplement textbook and lecture and it contains no details of operative technic. It attacks the problems from the point of view of the practitioner and is therefore likely to prove very useful.

The subject-matter is considered under five heads: Examinational Methods, Significance of Symptoms, Interpretation of Physical Signs and Methods of Treatment; finally, the Medico-legal Aspect of Gynecology is discussed. The fifth part is a welcome addition, though the difference between the law in England and in this country makes this section of less value to American physicians, and the example of the authors is one that deserves commendation.

The book is to be recommended highly for clearness of presentation, breadth of view and soundness of judgment. The illustrations are numerous and excellent. It is a pleasure to see such an adequate presentation of the subject.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

THE PROPAGANDA OF ANTI-VACCINATION.

THE attention of members of the Massachusetts Medical Society, and of all other physicians, is called to the letter from Dr. Woodward, President of the Society, published in the correspondence column of this issue of the JOURNAL. The annual recurrence of anti-vaccination propaganda does not arouse, as it should, the active opposition of the medical profession. Each year the margin by which anti-vaccination legislation is defeated seems to be diminishing. Ultimate passage of such legislation, however, could be due only to the apathy of physicians and to their failure to present to the public and to legislators, collectively and individually, the truth about vaccination and the fallacy of the anti-vaccination movement. Committees on medical legislation can accomplish little unless their action is supported by the firm and unanimous voice of the profession which they represent. During the coming season many legislative matters of medical importance, in addition to that of anti-vaccination, will be under discussion and will require the intelligent study of members of the profession, if they are to be decided with best regard to the public welfare. As in the past, it will be the effort of the JOURNAL to assist physicians in this way by presenting the facts on both sides of every question, with such discussion as may be helpful to its readers in the formation of individual opinion. Only by the concerted and active coöperation of all, however, can there be developed a genuine medical public opinion which shall be of value and power in the direction of medical legislation for the common good.

THE WORK OF DISTRICT MEDICAL SOCIETIES.

AT this time of year the chairmen and secretaries of various district medical societies, and others, are busily engaged in preparing their yearly programs of subjects to be discussed. This is an important piece of work, and we believe it does not always receive the mature and careful consideration which it deserves. The choice of subjects is far too apt to be left to the individual preference of the chairman or secretary, resulting in an ill-balanced list of papers and important omissions.

Medical societies have two very definite functions: (1) to promote social intercourse among the members, and (2) of more importance, to disseminate knowledge and to present facts and give information on important and vital subjects which the general practitioner can get in no other way. Individual preferences of this or that group of physicians ought not to be too seriously considered at these meetings. It is very likely that any group of busy general practitioners, tired out after a hard day's work, would be vastly more interested in a thrilling account of life in the trenches and war surgery than in a discussion of the importance of preventing the ravages of syphilis or the early diagnosis of tuberculosis. It is manifest, however, that the two latter subjects are of infinitely greater importance than the former.

This is strikingly illustrated in the programs of a certain large medical society in this state, which neither in its program for the coming year nor in its programs for the past three years, has included the subject of tuberculosis for the reason frankly given, that tuberculosis would not draw a crowd and that the doctors are not interested in it. To many this would not appear a sufficient reason for such an important omission. In the programs of 14 district medical societies in this state for the year 1915 there were 97 subjects discussed. Of these, 67 were what might be called distinctly clinical subjects, while 30 were non-clinical and dealt with topics relating to the broader aspects of medicine. Of this last group, 16 out of the 30 were papers relating to the present war, leaving 14 papers out of a total of 97 which took up the subjects of public health and preventive medicine. In view of the present tendencies of modern medicine this hardly seems a just proportion. We believe that more attention should be given to such subjects as medical education of physicians in the early diagnosis of cancer, tuberculosis and similar diseases, the improvement of our medical schools, the administrative control of the venereal problem, health insurance, etc., and we also believe that the majority of general practitioners in this State will agree with this point of view.

THE NAVY AS A FIELD FOR MEDICAL WORK.

THE attention of graduates in medicine under thirty-two years of age should be earnestly called to the opportunities offered by the Medical Corps of the United States Navy as a special field for professional work. Legislation has recently been enacted which will provide for approximately three hundred additional medical officers in this corps, giving immediate opportunity for work and advancement to those properly qualified.

The naval medical officer should be regarded as a specialist, concerned, it is true, with many departments of medicine, but approaching them all from a unique standpoint. His patients belong to a selected group and, under conditions of service in peace or war, offer particular clinical problems. Moreover, as such a group, the material afforded gives especial opportunity for work in preventive medicine and for discoveries in scientific branches of great value in the advancement of medical knowledge. The Navy, like the Army, constitutes a group of material under definite conditions of discipline which make possible research on a scale that cannot often be attempted under the uncontrolled conditions of civil life. Hence it is, that the appeal of the naval medical service is not solely to the instincts of a practitioner or to the love of adventure, but to those of the research student in medicine as well, whose aptitudes lie in the field of scientific medicine.

These considerations represent merely the field of opportunity to the individual; but there should not be forgotten also the opportunity of service which the naval medical officer enjoys in the diffusion of ideas in hygiene and allied medical branches, not only in his own country, but throughout the world.

The United States Navy has recently issued a circular for the information of persons desiring to enter its medical corps and another circular listing the physical qualifications required. Examinations for these positions are to be held in several of the coast cities of the United States, both East and West, and also in Chicago. Full particulars regarding the time and places of these preliminary examinations, with descriptive literature and the circulars mentioned above, may be obtained by addressing Dr. W. C. Braisted, Surgeon-General, United States Navy Department, Washington, D. C.

THE CUTTER LECTURES.

IN another column of this issue of the JOURNAL we publish a brief account of the life and work of Dr. John Clarence Cutter, founder of the Cutter lectureship on preventive medicine at the Harvard Medical School. The first quinquennium of this valuable institution has already been completed and the lectures thus far given, by men of distinction in the medical profession, have proved genuine contributions to the knowledge and exposition of the science of preventive medicine. In this connection, therefore, it is of interest to publish also the following list of Cutter lecturers with the dates and titles of their papers.

1. Dr. Wm. H. Park, March 13, 1912. Observations on Dosage and Methods of Injecting Antitoxin in the Treatment and Prevention of Diphtheria and Tetanus.
2. Dr. John F. Anderson, May 9, 1912. Some Re-

cent Advances in Our Knowledge of Certain Infectious Diseases.

3. Dr. George C. Whipple, March 31, April 2, April 7, 1913. The Use of Vital Statistics with Truth, with Imagination, with Power.
4. Dr. Mark W. Richardson, May 12, 1913, and May 14, 1913. Health Administration.
5. Dr. Charles V. Chapin, March 20, 1914. Science and Sanitation.
   March 27. Efficiency of Public Health Measures.
   April 2. Organization of the Health Department.
   April 9. Research and Publicity.
   April 16. Nuisance Problems.
   April 30. Contagious Disease Problems.
6. Dr. Cressy L. Wilbur, March 25 and 26, 1914. Vital Statistics in Massachusetts and the U. S.
7. Dr. Joseph Goldberger, April 2, 1915. Diet and Pellagra.
8. Dr. Victor C. Vaughan, April 14, 15, and 16, 1915. The Phenomena of Infection.
9. Dr. George W. McCoy, April 3, 1916. The Public Health Aspects of Leprosy.
10. Dr. Simon Flexner, April 26, 1916. The Finer Adjustments of the Immunity Reactions to Recovery from Infection.

PROGRESS OF POLIOMYELITIS.

DURING the past week the Massachusetts epidemic of poliomyelitis has, on the whole, declined, although the daily number of new cases still remains considerable. The total number of cases during the month of October was 703, as compared with 623 in September, 253 in August, and 107 in July. More careful statistical investigation has shown that during the month of August there were 67 deaths from this disease in Massachusetts instead of 39, as had previously been reported. These deaths were distributed among the several cities and towns as follows: Boston twenty; North Adams, ten; Springfield, five; Pittsfield, three; Somerville, three; Easthampton, two; Medford, two, and the following one each: Agawam, Amesbury, Bourne, Brookline, Dudley, East Longmeadow, Fall River, Georgetown, Greenfield, Haverhill, Holyoke, Lawrence, Littleton, Lowell, Lynn, New Bedford, Newburyport, Newton, Northampton, Southwick, Westfield and Worcester. In September there were 151 deaths, of which 57 were in Boston. Accurate data are not yet available for the number of deaths in October. During the first four days of November there were 45 cases.

The following statistics relative to the distribution of epidemic cases throughout the United States have been compiled from a recent weekly bulletin of the United States Public Health Service:

"Massachusetts, 1761; Maine, 104; Vermont, 35; New Hampshire, 53; Connecticut, 812; Rhode Island, 179; total, 2610. In New York City in the period aforementioned, there have been 9216 cases, of which 2373 were fatal.

"A comprehensive idea of the way the fingers of this disease have been laid upon the entire country may be gathered by figures from the report for widely separated sections.

"Nevada and New Mexico, from July 1 to Sept. 24, have been spared altogether, while Wyoming has seen only four cases from July 1 to Sept. 30; North Dakota, 8, July 1-September 25; and Utah 5, August 1-31—a gentle touch in the Rocky Mountain zone.

"New York State, exclusive of New York City, has a total of 3495. Adjoining the island of Manhattan, New Jersey registers 3917, and Pennsylvania, little separated, has 1561. Then the statistics taper in going South. Delaware, small in area, 57; Maryland, 254; South Carolina, 113; Alabama, 151; Louisiana, 31. Only eight cases were recorded in Florida.

"Illinois, in the Middle West, is relatively high, with 749 cases. Iowa has 198, Indiana 150, and Ohio 400.

"California with 50 cases, Oregon with 14, and Washington with 20, display no very great trouble along the Pacific slope.

"Indiana, Illinois and Ohio have been mentioned. Other Lake States showing some pressure are Michigan, 423, and Minnesota, 784.

"Statistics from all States practically all begin from July 1. They end variously at September 25, October 14 and October 17. In some States the disease is present, but its extent is not recorded. On this basis the country-wide total is 25,266 cases."

At the forty-fourth annual meeting of the American Public Health Association, held last month in Cincinnati, Dr. Thomas F. Harrington, of Boston, deputy commissioner of labor in Massachusetts, presented on October 26 a paper dealing with 42 cases of chemical poisoning from gas and fumes, reported during the past year to the Massachusetts State Board of Labor and Industries. Basing his argument upon a discussion of these cases, Dr. Harrington is reported to have advanced the theory that poliomyelitis is a disease due not to a microörganism, but to a chemical intoxication. In the daily press Dr. Harrington is quoted thus:—

"All observations point to one conclusion only, namely, that they are one and the same disease. Paralysis, neuroses, disturbance of movements, diminution of muscular power, twitching, wasting of muscles, hypersensitiveness, numbness and loss of sensation of the skin, eruptions on the skin, digestive disturbances, sore throat, bronchitis, psychoses, poliomyelitis, sclerosis of the cord, delirium, convulsions, coma and death constitute a group of symptoms com-

mon to both infantile paralysis and gas and fume poisoning.

"Dizziness, unconsciousness, mental confusion, convulsions and death have been reported among chauffeurs and others working on or about automobiles, in the open air as well as in confined spaces. Although cases of infantile paralysis have been recognized in many countries for years, nevertheless its prevalence in an endemic and epidemic form dates from the introduction and wide use of the automobile.

"In other words, in infantile paralysis we are dealing with a chemical agent and not with a microörganism, a condition identical to that met with in poisoning by the fumes of lead, mercury, arsenic and antimony.

"These gases and fumes are heavier than air and travel close to the ground, with a tendency to seek rivers, streams and ponds. This characteristic of these chemicals explains the greater prevalence of infantile paralysis among susceptible children living in lower parts of houses, and also the occurrence of epidemics of this disease among animals and fowl living in the ground stratum of air.

"The most successful treatment for gas and fume poisoning promises the best results in the treatment of infantile paralysis, namely, neutralize the acid condition by saline solutions—locally and intravenously, transfusion of blood, oxygen inhalations, hot baths, rest and warmth; for the later stages, rest, heat, massage, electricity, splints, hygiene.

"The preventive measures successful in combating industrial poisoning from gases and fumes suggest the line of action most promising in reducing the ravages of infantile paralysis, viz.: First, a recognition of the dangers in gases and fumes from motor fuel, especially for automobiles, and second, a close supervision by Government control of the nature of fuel used for motor vehicles, gas engines and for domestic purposes, to the end that the poisonous elements shall be reduced to a minimum in petroleum and coal tar products used for purposes of light, heat or power."

The complete report of Dr. Harrington's paper and the further exposition of his theory will be awaited with interest.

MEDICAL NOTES.

Gift to Columbia Dental School.—Report from New York states that on October 29 the trustees of Columbia University announced gifts to the sum of $125,000 for the establishment and maintenance of a dental school and infirmary in conjunction with the University.

Award of Damages Against a Midwife.—Report from San Francisco states that on October 24, Justice Murasky of the California Superior Court awarded damages to the amount of $25,000 against a graduate midwife who, it was alleged, had not exercised proper prophylactic care of a baby's eyes, with the result that it became blind from ophthalmia neonatorum. This verdict is of significance as indicating the opinion of this court, with reference not only to the responsibility of midwives, but to the extent of damages to be awarded for loss of eyesight in a baby.

Clinical Congress of Surgeons.—The seventh annual session of the Clinical Congress of Surgeons of North America was held in Philadelphia during the week of October 23 under the presidency of Dr. Fred Bates Lund of Boston, and in accordance with the program and announcement published in the issue of the Journal for October 5. The usual clinics were held before the several sections of the Society at the various Philadelphia hospitals. In accordance with a vote passed a year ago, adopting a follow-up system in connection with all cases operated before the Congress, a report was presented covering the end-results of the operations performed before the Congress last year in Boston. At the meeting on October 26, a resolution against dichotomy was adopted. It was voted that the next meeting of the Congress shall be held in New York, and Dr. John G. Clark of that city was elected president for the ensuing year. Other officers elected were Dr. George Henderson Dee, Galveston, first vice-president; Dr. Edgar W. Allen, Edmonton, Alberta, Canada, second vice-president; and Dr. Franklin H. Martin of Chicago, secretary general.

The annual meeting and convocation of the American College of Surgeons was also held in Philadelphia on October 27, and adopted a resolution establishing a board of surgical censors to control future admissions to the college. Two hundred and twenty-eight new Fellows were admitted at this session, of whom two were from Maine, four from Connecticut, eight from Rhode Island, and the following nine from Massachusetts: Drs. George D. Bliss, Dorchester; Charles William Bush, Frederick Lafayette Jack, James Krauss, Louisa Paine Tingley and Agnes C. Vietor, all of Boston; Gilman Leeds Chase, Clinton; Harry Cleveland Cheney, Palmer; and Ralph W. Jackson, of Fall River. The college now numbers over four thousand Fellows. At the business meeting, Dr. George W. Crile of Cleveland was elected president for the ensuing year, and Chicago was chosen as the permanent headquarters of the organization. It was announced that with the sanction of the United States Government the American College of Surgeons has appointed a commission to make a tour of South America for the purpose of establishing closer relationship between the surgeons of both continents of the Western Hemisphere. The members of this commission are: Drs. Edward Mar-

tin, Philadelphia; A. J. Ochsner and Franklin H. Martin, Chicago; Frank S. Simpson, Pittsburgh, and either C. H. or W. J. Mayo of Rochester, Minn.

EUROPEAN WAR NOTES.

BELGIAN SURGICAL DRESSINGS FUND.—The Belgian surgical dressings industry has fulfilled so satisfactorily the double purpose for which it was started in March, 1916,—that of giving employment to Belgian women refugees in England, and of increasing the supply of dressings for the army,—that its organizers feel justified in sending out a second appeal, in order to continue the work. Mrs. Erskine Childers, who has undertaken the management of the industry in London, as a branch of her great work for the Belgian refugees there, writes of the appreciation, on the one hand, of the Belgian Red Cross, for the supplies which they receive from the industry, and on the other, of the gratitude of the women for the opportunity given them to do this work, which is naturally most congenial, as by it they are helping their husbands, sons and brothers at the front. The extent of the work is limited only by the amount of funds procured, and Mrs. Childers is eager to increase as well as continue it.

Miss Olive Simes will gladly receive contributions for the Fund, addressed to her at 46 Chestnut Street, Boston.

MORTALITY FROM WAR AND FROM ALCOHOL.—Dr. C. W. Saleeby, F.R.C.S., F.R.S., a well-known English physician, has recently issued a statement relative to the comparative mortality due to war and to the use of alcohol by a community. He states that the annual loss of life in Britain amounts to three-fourths of the loss during the first year of the European War.

"The first year of the great war cost us about eighty thousand fine lives of our soldiers and sailors.

"But during every year of peace, alcohol takes at least sixty thousand lives in this country. On the most moderate reckoning it is responsible for one-seventh, or about 14% of the whole death rate. This toll of over a thousand lives a week, year in and year out, is three-fourths of the toll exacted by the greatest war in history.

"Estimating from the average size of a family and the known death rate from alcohol, we find that this destroyer of the people, by its destruction of husbands and fathers, makes 45,445 widows and orphans in England and Wales every year, or over 124 every day. These figures are an under-statement, for they do not recognize the fact that the mortality due to alcohol is really much higher among men than women.

"We have in this country an infant mortality of about one hundred thousand per annum, and a mortality of infants before birth which is at least as high. It is estimated that not less than half of this ante-natal mortality, namely, fifty thousand lives per annum, is due to syphilis. Over the whole of this colossal loss of life, before and soon after birth, amounting to not less than 200,000 lives annually, is the trail of alcohol, either doing its deadly work hand in hand with syphilis or destroying life directly on its own account.

"Obviously, therefore, the abolition of the mortality directly and indirectly due to alcohol would vastly more than compensate for the unprecedented loss of life due to the deadliest war in history."

WAR RELIEF FUNDS.—On Nov. 4 the totals of the principal New England relief funds for the European War reached the following amounts:

Belgian Fund	$162,906.12
French Wounded Fund	131,312.85
Armenian Fund	105,681.21
Serbian Fund	104,649.07
Surgical Dressings Fund	55,259.66
Polish Fund	46,748.78
Italian Fund	26,358.54
Permanent Blind Fund	21,310.94
Prince of Wales Fund	16,015.68
P. S. D. Fund	9,814.68
French Phthisis Fund	5,834.50

BOSTON AND NEW ENGLAND.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Saturday noon, Nov. 4, 1916, the number of deaths reported was 222, against 205 for the same period last year, with a rate of 15.22 against 14.28 last year. There were 36 deaths under one year of age, against 39 last year, and 61 deaths over 60 years of age, against 62 last year.

The number of cases of principal reportable diseases were: diphtheria, 39; whooping cough, 4; scarlet fever, 13; typhoid fever, 2; measles, 14; tuberculosis, 32.

Included in the above were the following cases of non-residents: diphtheria, 9; scarlet fever, 3; typhoid fever, 1; tuberculosis, 5.

Total deaths from these diseases were: diphtheria, 5; measles, 1; whooping cough, 1; tuberculosis, 16.

Included in the above were the following deaths of non-residents: diphtheria, 1.

BOSTON ASSOCIATION FOR THE RELIEF AND CONTROL OF TUBERCULOSIS.—The Annual Meeting of the Boston Association for the Relief and Control of Tuberculosis is to be held at the Twentieth Century Club, Boston, on Friday, November 10, at 3.30 p.m.

The three leading speakers are Edward R. Baldwin, M.D., director of the Saranac Lake

Laboratory and president of the National Association for the Study and Prevention of Tuberculosis; Homer Folks, LL.D., director of the National Association and secretary of the State Charities Aid Association of New York; and Lee K. Frankel, Ph.D., sixth vice-president of the Metropolitan Life Insurance Company.

The subject to be treated is "Tuberculosis from the Medical, Social and Industrial Point of View," Dr. Baldwin speaking from the medical point of view, Mr. Folks from the social and Mr. Frankel from the industrial. The meeting should be of unusual interest to physicians. It is open to the public.

BERI-BERI IN NEW BEDFORD.—Report from New Bedford, Mass., states that on October 24, six cases of beri-beri were discovered aboard a schooner recently arrived in that port from the West African coast. The patients were the captain, two officers and three sailors of the crew.

REPORT OF BOSTON HEALTH DEPARTMENT.—A recently published monthly bulletin of the Boston Health Department contains data showing a considerably larger total mortality in this city during the first nine months of this year than during the corresponding period in 1915. The following abstract of the report indicates the distribution of this mortality.

"Total deaths in Boston for the thirty-nine weeks of this year are 10,054, compared with 9337 for 1915. Non-resident deaths, included in the total, have so far numbered 1373, as compared with 1269 a year ago. Pneumonia has claimed 1308 victims this year, as against 1127 last year; cancer, 679 this year, compared with 708 last year; heart disease, 1355 this year, compared with 1245 last year; diarrhea and enteritis, under two years, 300 this year, compared with 348 last year.

"Deaths from communicable diseases fall slightly lower than last year's total, with infantile paralysis excluded. There have been 1212 such deaths this year, compared with 1230 a year ago. Diphtheria last year resulted in 175 deaths. So far this year there have been 137. Scarlet fever last year resulted in 75 deaths, and only 34 this year. Measles last year resulted in 32 deaths, and this year 91. Typhoid fever last year was responsible for 31 deaths, and this year the number has been 13. Whooping cough last year claimed 73 deaths and this year 60. Tuberculosis last year resulted in 844 deaths and this year 877.

"This has been a very active year with measles, a total of 5128 cases having been reported, compared with 4824 last year. This is the only instance that the total in communicable diseases was larger than last year. Diphtheria shows a falling off of 363 cases; scarlet fever, 1042; typhoid fever, 127; whooping cough, 248; and tuberculosis, 160."

Obituary.

DAVID FRANCIS LINCOLN, M.D.

WITH the death of Dr. David F. Lincoln, which occurred suddenly on Tuesday, October 17, there passed away a man who deserves well to be remembered by the medical profession of this city. But few remain who could call themselves, in a distinctive sense, his colleagues; and the life that he had led for many years before his death was so quiet, and so remote from the world of modern medicine, that the younger members of our fraternity have had little opportunity to become familiar even with his name, much less to make themselves aware of his fine qualities of heart and mind.

Dr. Lincoln was born in Boston on January 4, 1841, and received his primary and secondary education in our Boston schools. He entered Harvard College at the age of sixteen, with the Class of '61, in company with many men who afterward became distinguished. Those whom I happen to associate especially with him are Henry P. Bowditch, Wendell P. Garrison, N. P. Hallowell, James K. Stone, and Edward Wigglesworth; but class feeling in general was strong in him. Then, as later, he was shy, quiet, and retiring, but he always commanded the respect and friendship of the best of his associates.

Graduating just as the Civil War broke out, he enlisted in the Navy, remaining in that service for a period of one and one-half years. He then studied medicine in the Harvard Medical School, and in 1865 served as house officer at the Boston City Hospital, in company with Drs. Edward G. Loring, Michael Gavin, John Dole and Clarence J. Blake. A trip to Europe followed, and he spent two years there in medical study, leaning toward the specialty of neurology. It was at this time that I first learned to know him well, and became attracted to him for the independence, loyalty, and intrinsic interest of his character.

After his return to America, Dr. Lincoln practised medicine for several years, as a specialist in neurology. It soon became evident, however, both to him and to his friends, that, with his habit of silence on the one side, and blunt speech on the other, he was not likely to make his way as a practitioner, although every one who knew him well recognized, underneath his exterior of silence, remarkable qualities of learning, gentleness, even playfulness, and broad, kindly interests in humanity.

Finding that medicine did not go, he tried his hand at teaching, for which in certain ways he was well fitted. Latin and Greek were his specialties in this profession, and he taught them in private schools and also at Hobart College in the pleasant town of Geneva, N. Y., where he filled an important position, with happiness and success.

Returning to Boston, he occupied himself

with various matters referring to public health and hygiene. A very early and warm friend of his was the late Mr. James M. Barnard, who, like himself, was an ardent and single-minded lover of progress and a man who worked better upon his own lines than in harness with other men. For several years these two served as the president and secretary and chief helpers of a society devoted to the interests of public health, to which a number of other friends of Dr. Lincoln, including myself, also belonged.

For many years Dr. Lincoln was a true friend and helper of the George Junior Republic, where he made frequent visits, and with the workings of which he made himself intimately familiar. At the same time he espoused the cause of backward children in the public schools, spending a great deal of time in the actual teaching of certain of them, and doing what he could to see that the needs of all were appreciated and met.

For a good many years before his death he lived in small and very modest quarters on one of the quiet little streets of Beacon Hill, better known to our ancestors than to ourselves, and here he made himself the personal friend, to a degree that but few even of those who stood nearest to him were aware, of many children whose acquaintance he had made either in the schools or in the neighborhood of his rooms. He had long been in the habit of working in the North End Union, with Mr. Samuel F. Hubbard, and his neighborhood work was a logical extension of this. These children, of various nationalities and color, he stimulated to read and study, and aided to form clubs. Altogether, he played a part in their restricted lives which was of priceless benefit to them, and the affection they gave him testified to their appreciation.

Dr. Lincoln was always a reader and a student, and he had a first-rate power of literary appreciation and criticism. This, together with the genuineness of his interests, made him a very agreeable talker on all matters which he had set himself to study.

On the morning of October 17 he was found sitting in his chair, so quietly, and with such a natural expression, that it seemed, at first, impossible to think of him as dead. His books and papers were around him, and his relatives who took charge of them found a number of charming bits of writing of which they had not known.

His only published work of any magnitude, so far as I remember, was a compendium of physiology, for use in schools. This was an excellent book and filled a real need.

But quietly though he lived, the part which he played in the community was real and important, and one could say of him with warmth and emphasis,

"Nec vixit male qui natus moriensque fefellit."

JAMES J. PUTNAM.

Correspondence.

THE PROPAGANDA OF ANTI-VACCINATION.

Worcester, Oct. 30, 1916.

Mr. Editor:—

The enclosed letter with its startling contribution to the etiology of infantile paralysis deserves publicity were it only to emphasize the colossal impudence of the person who signed it.

Its third paragraph does, however, state the exact truth and I wish at this time to call upon every member of the Massachusetts Medical Society to constitute him- or herself a committee of one to interview those who are to be members of the next legislature, to impress upon them the importance of retaining the present law and the punishment sure to follow its repeal.

Very sincerely,

SAMUEL B. WOODWARD, M.D., *President*,
Massachusetts Medical Society.

720 Tremont Temple, Boston, Mass.,
Oct. 20, 1916.

Dear Dr. Woodward:—

The psychological moment to repeal the Compulsory Vaccination Law is the next session of the Legislature,—owing to the tremendous excitement over infantile paralysis which many experts believe is the inevitable outcome of generations of vaccination.

We need money. If everyone in sympathy with our cause will do what they can to help we can win out this year!

Last year we practically won with a vote of 127 in our favor to 105 against, at the second reading of the bill. This was the largest roll-call in the history of the commonwealth, not even excepting the election of the Speaker of the House. I mention this to show you the tremendous interest in and pressure brought to bear on our measure. At the third reading of the bill the opposition brought every ounce of their power against us, and we only lost by a few votes. Therefore we have reason to feel proud of the splendid fight we made!

We must have funds for office expenses, for a paid worker to cover the state, which means traveling expenses, literature, etc.; all of which counts up.

As in past years, I stand ready to do all the stenographic work gratis. But to win I must be relieved of financial worry which I have cheerfully borne for so many years.

Won't you make a special effort to let your contribution be so large that we can win out this year and be forever rid of this unjust law? May we hear from you at once so that we may push matters all over the state before the legislature convenes?

Faithfuly yours,

JASSICA L. C. HENDERSON, *Vice-President*,
Anti-Vaccination League of America.

ERRATUM.

IN the issue of the JOURNAL for October 26, 1916, (Vol. clxxv, p. 589) there was an error in the second table in the second column, entitled "Percentage of Total Cases." The first figure in the third column should be "37" instead of "7," so that the table should read as follows:

PERCENTAGE OF TOTAL CASES.

	Under 5	5-10	Over 10
Rural Group	37	26	37
North Adams	76	24	0